



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

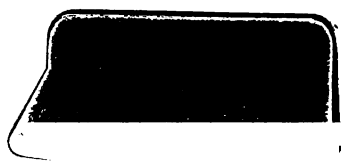
- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>

THROAT DISEASES
AND
THE LARYNGOSCOPE

DOUGLAS HEMMING



.

1



THROAT DISEASES,
AND THE
USE OF THE LARYNGOSCOPE.

BY THE SAME AUTHOR.

In Preparation—Uniform with the present Work.

EAR DISEASES:

A HANDBOOK OF AURAL SURGERY FOR PRACTITIONERS
AND SENIOR STUDENTS.

Fcap. 8vo. 1s. Each.

PAPERS ON AURAL AFFECTIONS.

1. TINNITUS AURIUM: its Causes and Treatment.
2. OTORRHOEA: its Varieties, Causes, Complications, and Treatment.

THROAT DISEASES,
AND THE
USE OF THE LARYNGOSCOPE;

A HANDBOOK FOR PRACTITIONERS
AND
SENIOR STUDENTS.

BY
W. DOUGLAS HEMMING, F.R.C.S.Ed.,

FELLOW OF THE MEDICAL SOCIETY OF LONDON;
FORMERLY ASSISTANT SURGEON, CENTRAL LONDON THROAT
AND EAR HOSPITAL; ETC., ETC.

ILLUSTRATED WITH WOOD ENGRAVINGS.



LONDON:
J. & A. CHURCHILL, NEW BURLINGTON STREET,
1881.

151. o. 601.

—
—
—

CHARLES ANDERSON,
PRINTER,
120, ALDERSGATE STREET, LONDON, E.C.

TO
GEORGE JOHNSON, M.D.; F.R.S.; F.R.C.P.,
ETC., ETC.,
SENIOR PHYSICIAN TO KING'S COLLEGE HOSPITAL;
PROFESSOR OF CLINICAL MEDICINE IN KING'S COLLEGE, ETC.;
ONE OF THE EARLIEST IN THIS COUNTRY
TO RECOGNISE THE VALUE OF THE
LARYNGOSCOPE,
AS AN AID IN DIAGNOSIS AND TREATMENT;
AND MY FIRST INSTRUCTOR IN ITS USE;
AS A SMALL MARK OF
SINCERE RESPECT AND ESTEEM,
I DEDICATE
THIS LITTLE BOOK.

P R E F A C E.

THE aim of this work is to give a brief account of the diseases of the Throat, including the use of the Laryngoscope and Rhinoscope.

Making little pretension to originality, much of the work is derived from the writings of previous authors, especially Morell Mackenzie, Lennox Browne, George Johnson, Prosser James, Gibb, Czermak, Isambert, Mandl, Niemeyer, Schnitzler, Ziemssen, Wendt, Moure, Barth, Spencer Watson, Roosa, Politzer, Cadier, &c., to whom I here express my obligations.

In a work of this size it is neither desirable nor possible to enter into minutiae required only by the specialist, as I write for those engaged, or about to engage, in the general practice of the profession.

Those who desire further to study Throat diseases should read the larger works of the above authors, especially Dr. Morell Mackenzie's "Manual of Diseases of the Throat and Nose," and "The Throat and its Diseases," by my former colleague, Mr. Lennox Browne, to whose personal instruction I take this opportunity of expressing my indebtedness for much of my knowledge of this branch of practice.

For the illustrations of instruments, I am indebted to Messrs. Krohne and Sesemann; the remainder of the cuts I myself drew on the wood, those of morbid conditions, except Fig. 31, being from cases occurring in my own practice.

In conclusion, I trust that the publication of this little work may tend to make the use of the Laryngoscope more general in everyday practice.

W. DOUGLAS HEMMING.

BOURNEMOUTH, June, 1881.

CONTENTS.

CHAPTER I.

	PAGE.
THE INVESTIGATION OF THROAT DISEASES ...	1

CHAPTER II.

THE GENERAL PATHOLOGY OF THROAT DISEASES ...	21
--	----

CHAPTER III.

THE LOCAL TREATMENT OF THROAT DISEASES ...	32
--	----

CHAPTER IV.

DISEASES OF THE NASO-PHARYNX ...	46
----------------------------------	----

CHAPTER V.

DISEASES OF THE PHARYNX, THE TONSILS, AND THE UVULA	60
---	----

CHAPTER VI.

DISEASES OF THE LARYNX ...	87
----------------------------	----

CHAPTER VII.

DIPHTHERIA ...	113
----------------	-----

THROAT DISEASES

the only things necessary. As regards the light, sunlight, if it were generally available, would be undoubtedly the best; but in our cloudy, overcast, often sunless clime, recourse must be had to some form of artificial light. Gas is the most useful and convenient source of light; but if this be not available, a very good illumination may be obtained from an oil-lamp,

CONTENTS.

As the paragraph referring to Duplay's reflector (page 5) is liable to misinterpretation, I have pleasure in saying that it is not intended to imply that Mr. Lennox Browne assumes the authorship of that instrument, as in his book he attributes it to Duplay. He, however, having been the first to employ it in this country, and to advocate its advantages over others, his name is associated with it in the catalogues of English instrument Makers, especially Messrs. Krohne and Sesemann, for whose firm Mr. Lennox Browne superintended the drawings of all instruments employed by him. Many of these accurate illustrations appear (by permission) in the following pages.

CHAPTER VII.

DIPHTHERIA	118
------------	-----	-----	-----	-----	-----	-----	-----	-----

THROAT DISEASES

AND THE

USE OF THE LARYNGOSCOPE.

CHAPTER I.

THE INVESTIGATION OF THROAT DISEASES.

Before proceeding to an account of the various diseases of the throat and adjacent regions, it will be well to describe the methods, and instruments, in use for investigating the condition of the several parts and cavities. The special instrument is, of course, the laryngoscope, and to this full attention will be given.

Before coming to this, however, I will consider the investigation of the pharynx, including the cavity of the mouth, the uvula, tonsils, &c. For examining this region, no very complicated instruments are required; a good light, and some form of tongue depressor, being the only things necessary. As regards the light, sunlight, if it were generally available, would be undoubtedly the best; but in our cloudy, overcast, often sunless clime, recourse must be had to some form of artificial light. Gas is the most useful and convenient source of light; but if this be not available, a very good illumination may be obtained from an oil-lamp.

or even from a candle, if some means be adopted for concentrating and directing the rays.

FIG. 1.



**MACKENZIE'S RACK-
MOVEMENT LAMP.**

FIG. 2.



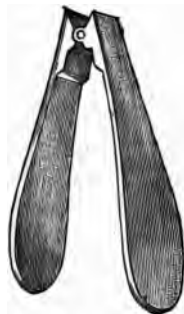
BENZOLINE LAMP.

The method usually adopted in this country for this purpose, is to place in front of the light a bull's-eye condensing lens, which, collecting the rays, throws them into a reflecting mirror worn in front of the fore-

head or of one eye of the observer, whence they are reflected into the open mouth of the patient. A convenient form of lamp is one made in the shape of the "Queen's" reading lamp, which may be placed on a table and connected with the nearest gas burner by a flexible tube. A more complete arrangement is that known as Mackenzie's rack-movement lamp* (Fig. 1).

For use by the bedside, or in the patient's own

FIG. 3.



TONGUE DEPRESSOR.

house, there is made a very convenient little portable lamp, which burns the vapour of benzoline, and gives a fair light, sufficient for all ordinary purposes of examination (Fig 2).

An obstacle to the obtaining a good view of the back

* All the instruments and appliances here mentioned, may be obtained of Messrs. Krohne and Sesemann, Duke-street, Manchester-square, to whom I must express my acknowledgments for the use of the illustrations of instruments here given.

of the throat will be found in that "unruly member," the tongue. An ordinary tongue-depressor, however, (Fig. 3), will generally suffice to get the organ sufficiently out of the way to obtain a view of the pharynx.

Various forms of tongue-depressor have been devised, but there does not seem any very great advantage in one over the others. The one figured I have found to answer all purposes, and a spoon or a paper-knife will, in skilful hands, be found quite as efficacious as more elegant and complicated instruments.

The normal appearance of the pharynx must be familiar to every practitioner; indeed, anybody may see it for himself by opening the mouth widely before a looking-glass. Above is the soft palate, passing off into the pillars of the fauces, with the tonsils on either side (almost invisible in a normal pharynx), and the uvula hanging down in the middle, the whole being backed by the posterior wall of the pharynx.

Connected with the investigation of this region is that of the naso-pharyngeal space and posterior nares. This is accomplished by the aid of the rhinoscope, which, being essentially but a modification of the laryngoscope, will be described after that instrument. Then, also, will be described the methods of examination of the anterior nares.

Now we come to the consideration of the laryngoscope, an instrument which has been invented, and brought to perfection, within very recent times, and the introduction of which has done an immense deal to make certain our diagnosis, and facilitate our treatment, of the diseases of the lower part of the throat.

Into the history of this valuable instrument I shall not enter here. Those interested in it will find it fully discussed in the works of Morell Mackenzie, Prosser

James, George Johnson, Duncan Gibb, &c., and to those pages I must refer them. In a work of this size I cannot describe all the numerous little variations to which the instrument is subject, but shall merely give an account of that form which I have seen most frequently employed, and which I myself am in the habit of using in practice.

The laryngoscope consists essentially of two mirrors, the frontal mirror or reflector, which is worn by the observer on the forehead or in front of one eye, and the laryngeal mirror, a small circular piece of looking-glass, or polished metal, mounted at an angle on a shank, and attached to a handle, for insertion into the back of the patient's mouth.

The reflector is arranged and mounted in various ways. Some authorities prefer it attached to an elastic band, which is worn round the head (Johnson), while others prefer it attached to a spectacle frame (MacKenzie, &c.) In either case the reflector, which is a slightly concave mirror, of about $3\frac{1}{2}$ or 4 inches in diameter, of a focal power of about 14 inches, and perforated in the centre, is fixed to its support by a ball-and-socket joint, so as to be freely moveable.

The form of mounting, which I am myself in the habit of using, is that originally devised by Duplay, and now sold by Krohne and Sesemann as Lennox Browne's, (Fig. 4). In this instrument the lower rim of the spectacle frame is removed, and it is supported on the nose by a plate of metal. This form I have certainly found the lightest and least fatiguing, a matter of no small consideration when it has to be worn almost continuously for some hours, as in hospital work.

The laryngeal mirror is, in this country, usually made round, and consists of a small reflector fixed at an angle of 120° on a metal shank to which a handle

is attached, the whole measuring about 8 inches in length (Fig. 5).

FIG. 4.



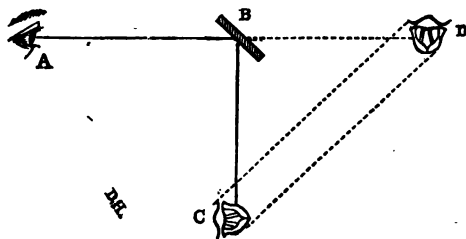
LARYNGEAL REFLECTOR.

FIG. 5.

LARYNGEAL
MIRROR.

The mirrors are made in several sizes, the diameter varying from half-an-inch to an inch-and-a-quarter. Mirrors are also made oval and diamond-shaped, but the round ones will be found the most generally useful. A mirror of as large a size as can conveniently be introduced, should be employed, in order that the field of vision may be as extensive as possible.

FIG. 6.



A. THE OBSERVER. B. THE LARYNGEAL MIRROR.
C. THE LARYNX. D. THE VIRTUAL IMAGE SEEN
BY THE OBSERVER.

In order to become familiar with the normal appearances of the larynx, and to acquire skill in the use of the laryngoscope, every opportunity should be taken of examining the larynx of healthy persons—if the student can persuade any good-natured friends to submit themselves to be the subjects of his attempts, so much the better. It is only by constant practice that skill can be obtained, and departures from the normal condition easily and promptly recognised, a remark which applies to all methods of physical examination as much as to the use of the laryngoscope.

The principle on which the action of the laryngoscope depends, is that simple and fundamental optical

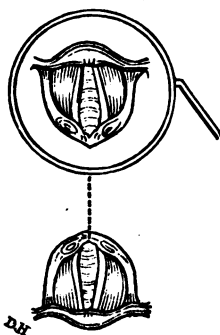
law, that the angle of reflection is equal to the angle of incidence when a ray of light falls upon a plane surface.

It must not be forgotten that we see, not the larynx itself, but its image, reflected in the mirror placed at the back of the mouth. This is a virtual image behind the mirror, of the same size as the object, and at the same distance from the mirror as the object.

The diagram, (Fig. 6) after Mandl, shows this better than many words.

A little reflection and practice will show that in the image there is no actual reversal, but the picture being seen vertical instead of horizontal, the parts

FIG. 7.



which are posterior in the larynx appear at the lower part of the image, while the epiglottis which is in front of the larynx appears above in the image. Laterally, there is no reversal whatever; the right vocal cord of the patient is seen towards his right side, corresponding, of course, to the observer's left, and *vice versa*.

The accompanying diagram, (Fig. 7) after Prosser James, will help to make this clear, and it is a point which should be well understood.

For the surgeon to make a laryngoscopic examination, the patient should be seated on a music-stool or a chair, which may with advantage be fastened to the floor. Its back may be against a wall, or have a head-rest attached. The light should be placed on one side of the patient, and about on a level with his eyes. It is

matter of indifference on which side the light is placed, though in this country it is, perhaps, more usually on the patient's left. The surgeon should sit exactly opposite the patient, and throw the light, by means of the reflector, into the mouth, in such a way that the centre of the disc of light is on the uvula.

The patient should now be directed to protrude the tongue, which the surgeon should hold gently with a cloth between the thumb and forefinger. Care must be taken not to pull on the tongue with any degree of force, as so doing will only cause it to rise up at the osorus and defeat the very object we have in view, i.e., to keep it out of the course of the rays of light. In some cases even it will be found better to allow the tongue to remain quietly in the mouth, or to depress it gently with a tongue-depressor.

The surgeon should now slightly warm the mirror, by holding it for a few seconds over the lamp—this is to prevent the breath condensing on the cold surface and blurring the image—its temperature being tested against the cheek or hand of the surgeon, before insertion into the patient's mouth, lest it be used too hot and burn the throat.

The patient's mouth being widely opened, the head thrown slightly back, the tongue protruded and held, the disc of light thrown on to the back of the pharynx, and the mirror warmed, the surgeon should introduce the latter steadily and rapidly, without touching the tongue or palate, until the back of it rests against the uvula. This should be pushed gently upwards and backwards, care being taken not to touch the posterior wall of the pharynx, or "gagging" and "retching" will ensue.

An image of the larynx should now be seen in the mirror. At first, however, probably only the base of the tongue, or, perhaps, the epiglottis, will be visible;

but a little manœuvring of the mirror will soon bring the posterior parts of the larynx, the cartilages of Santorini and Wrisberg, and then the vocal cords, into view.

The last named will be at once recognised by their pearly white appearance. If the patient be now in-

FIG. 8.

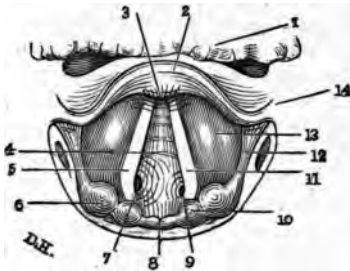


structed to phonate the syllable "ah," the cords will be seen to approach, and if he take a breath they will recede from each other.

Fig. 8 (after Mandl) shows in section the position of the head, tongue, and mirror, so as to obtain the

most complete view of the larynx. The handle of the mirror is not represented in the drawing, in order to avoid confusion of lines.

FIG. 9.

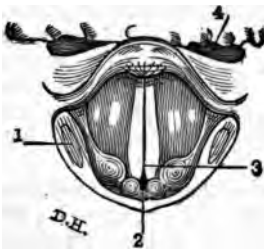


1. Base of tongue.
2. Epiglottis.
3. Cushion of Epiglottis.
4. Trachea.
5. Right vocal cord.
6. Cartilage of Wrisberg.
7. Right bronchus.
8. Inter-arytenoid fold.
9. Left bronchus.
10. Cartilage of Santorini.

11. Left vocal cord.
12. Ary-epiglottic fold.
13. Left ventricular band.
14. Left glosso-epiglottic fold.

The appearance of the larynx as reflected in the mirror, is represented in Figs. 9 and 10. Fig. 9 represents the larynx during inspiration when the cords are separated, and Fig. 10, during phonation, when they are approximated to one another.

FIG. 10.



1. Cornu of the hyoid bone.
2. Posterior commissure of the vocal cords.
3. Vocal process.
4. Vallecula.

Such a complete view as this will not usually be obtained all at the same time, but by moving the

mirror slightly the different parts are brought successively into view, which make up the complete picture.

I do not intend in these pages to give any account of the anatomy of the larynx, which may be found in any good text book of anatomy. Those of my readers who are unable to study the anatomy on the cadaver, will find great assistance from the *Moveable Atlas of the Larynx*, designed by Professor Witkowski, of Paris, which gives a very clear idea of the relative positions of the various parts.

These are also shown in the Figures 9 and 10, but it must be mentioned that the observer must not expect every healthy larynx to be exactly like the typical one represented. There are many deviations from the typical form which are perfectly compatible with health. The epiglottis especially is liable to remarkable varieties, both in form and position. In some cases it stands up straight, in others it may lie so flat over the glottis as to render a view of that space almost impossible. A study of some larger work where these varieties are depicted, or still better, the practical examination of many throats, will render these differences familiar.

In those cases where the epiglottis lies so much down upon the larynx as greatly to obstruct the view, the obstacle may frequently be overcome by changing the position of the mirror, or the inclination of the patient's head. Instruments have been devised for holding up the epiglottis by means of a thread passed through it, for drawing up the uvula, &c., &c.; but they are very rarely employed in this country.

Having described the method of making an examination on a presumably favourable subject, it will now be well to consider briefly some of the difficulties which lie in the way of the beginner in laryngoscopy.

One of the first difficulties lies in the nervousness of

the patient, which is especially conspicuous in the case of women and children. As a means of overcoming this it should always be explained to the patient that the proceeding is only for purposes of examination, not involving any operation, and the harmlessness of the instrument may, perhaps, be demonstrated by the surgeon upon himself. Many obstacles may be overcome by gentleness, perseverance, good temper, and encouragement, and with their assistance we may often obtain a view in a case which at first sight appeared hopeless. The patient should always be instructed to continue to breathe naturally throughout the examination; many persons consider it is necessary to hold the breath, a proceeding which, of course, soon becomes irksome.

Obstacles may be due to faults on the part of the observer, or to imperfect illumination; but far more often they come from the side of the patient. The obstacles which the observer puts in his own way are usually due to want of practice, roughness or carelessness, or to the use of inefficient, clumsy or worn out instruments.

Care must be taken that the light is thrown in a good clear disc upon the back of the throat and maintained there, the observer following, by moving his own head, the involuntary movements of the patient. The observer must be careful not to introduce the mirror too hot, lest the patient's palate be burnt, in which case, probably, the patient would lose his temper, and the surgeon, possibly, would lose his patient.

The mirror should not be kept long in the mouth at a first examination. All that is required may be learnt quite as well by several short examinations as by one long one, and with much less inconvenience to the patient. The tongue should not be touched by the mirror in its passage, or retching may be induced.

The remaining difficulties are those appertaining to

the patient. Sensitiveness and intolerance of the presence of the mirror may be due to nervousness, or to the morbid condition of the throat itself. In cases of simple congestion, or of phthisis, the throat is usually very intolerant of the mirror; while in syphilis, on the other hand, its presence is borne remarkably well. Great irritability of the palate and fauces may often be much reduced by sucking ice, or applying some astringent solution.

Among physical obstacles, the tongue occupies a prominent place; it sometimes arches up so much, the moment the mirror is placed in the mouth, as altogether to spoil the view. As I have remarked, in such cases pulling on it is of no use; but, with patience, it will often be found that after a few attempts the unruly member will lie quietly inside the mouth, and permit the examination to be easily and successfully made.

A very much relaxed uvula may form a difficulty, and hypertrophy of the tonsils will put an obstacle in the way of the placing the mirror in position by narrowing the isthmus of the fauces. These obstacles may be overcome by using various sizes of mirrors; a large mirror will be useful for supporting the enlarged uvula, and a small mirror will be required when the tonsils are enlarged.

I have already mentioned the difficulty caused by a very pendent epiglottis. This may usually be overcome by causing the patient to put the head well back, and to draw the breath, and phonate somewhat high sounds.

Autolaryngoscopy.—To acquire skill and confidence in the use of the laryngeal mirror, the practice of autolaryngoscopy—the laryngoscopic examination of one's own throat—is useful. There are various methods of accomplishing this, each of which has its own advocates and supporters. The simplest, easiest,

and most satisfactory, in my opinion, is that devised by Dr. George Johnson, which I cannot describe better than in his own words:—"The concave reflector on the forehead, and the laryngeal mirror which is used in the examination of others, with a common looking-glass and a lamp, constitute the whole of the apparatus. The method of operating is this:—Sitting at a table of convenient height, I place a looking-glass at a distance of about eighteen inches in front of me, and a moderator or a gas lamp on one side of the glass, but two or three inches further back, so that the light may not pass directly from the lamp to the mirror. Now, with the reflector on my forehead, I direct the light, as it were, into the open mouth of my own image in the looking-glass; then introducing the laryngeal mirror into my mouth, I see the reflection of my larynx and trachea in the glass before me, and anyone looking over my head or shoulder can see the image at the same time. This method, therefore, serves for autolaryngoscopy and for demonstration; in other words, the experimenter can, by this means, see his own larynx and show it to others."*

For self-instruction in laryngoscopy also, the "Laryngo-Phantom," introduced into this country by Krohne and Sesemann, will be found valuable. It is made so as to resemble in form the cavity of the mouth, with the tongue and uvula, &c. Coloured drawings of the larynx in various conditions, normal and pathological, are provided. If these are inserted by the student at hap-hazard, and he endeavours to apply his knowledge to a diagnosis of the condition represented, he will soon familiarise himself with the various appearances, and will be able to put the know-

* The Laryngoscope: two lectures by George Johnson, M.D., F.R.C.P. (London: R. Hardwicke. 1864). Page 28.

ledge thus gained to practical use when examining real patients.

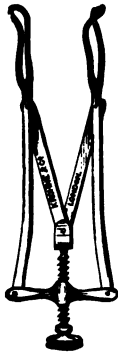
Having now described the examination of the pharynx and larynx, we come to that of the nasal passages and naso-pharynx. The nasal passages may be examined from in front or behind—*anterior or posterior rhinoscopy*, as it is called. For examination of the nasal passages from the front, or *anterior rhinoscopy*, some form of nasal speculum, by which the nostrils may be dilated, is required. There are many of these; but the one I have found most generally useful, is that known as *Fränkel's* (Fig. 11). A very useful instrument, also, is the one illustrated in Fig. 12. This is known as *Duplay's*.

In order to facilitate the examination of the naso-pharyngeal space from the front, Professor Zaufal has recently devised a new form of speculum. This consists (Fig. 13) of a cylindrical tube with a funnel-shaped end, very much like an elongated ear speculum. These tubes are made in various diameters, varying from 3 to 7 millimetres. Under normal conditions of the mucous membrane, and with a fairly spacious nasal cavity, this speculum may be inserted without much difficulty; and by throwing a strong light through it from the reflector, a good view of the neighbourhood of the orifices of the Eustachian tubes may be obtained, and of some parts of the naso-pharyngeal cavity, which can be seen by no other method. These specula are made either of metal, or hard rubber. The latter are lighter, and are in some respects preferable, as they give a more clearly defined view than those made of polished metal.

The same method of illumination may be employed for rhinoscopy, both anterior and posterior, as for laryngoscopy.

I shall not enter here into a description of the ap-

FIG. 11.



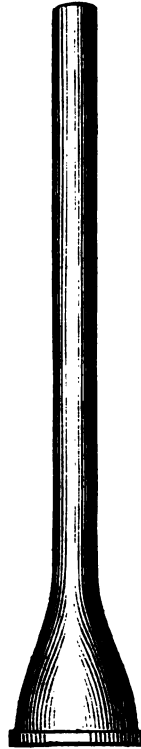
FRANKEL'S
NASAL
SPECULUM.

FIG. 12.



DUPLAY'S NASAL SPECULUM.

FIG. 13.



ZAUFAL'S
NASO-PHARYNGEAL
SPECULUM.

pearance of the anterior nares, as it may be more easily and better learnt by practical examination than by pages of description, and I do not intend in this work to treat of the diseases of the nose. The beginner in anterior rhinoscopy, however, must be on his guard against mistaking for polypi, the projecting turbinated bones, the mucous membrane of which is often thickened and swollen, a mistake which is not unfrequently made. The use of a probe will help to settle the question.

Posterior Rhinoscopy may be considered as a modification of laryngoscopy, and as such it was first described by Czermak and others. The same forms of reflector and of mirror are used, and the light is thrown into the mouth in a similar way. The mirror used must be one of a small size.

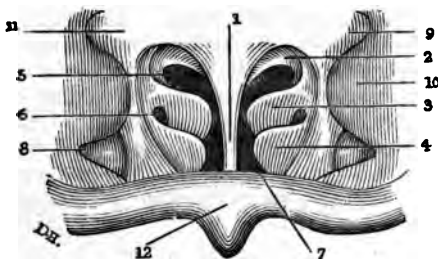
The head of the patient should be held straight up, or inclined slightly forward, instead of being thrown back as in laryngoscopy, and the tongue is allowed to remain quietly in the mouth, it sometimes being necessary to hold it down with a spatula. The small mirror is then warmed, and introduced behind the soft palate on one side of the uvula, with its reflecting surface upwards. An image of the posterior orifices of the nostrils, and of the parts about the orifices of the Eustachian tubes, should now be visible in it. The process of examination is a more difficult one than that of laryngoscopy, on account of the very limited space; indeed, in some cases the obtaining of a rhinoscopic view may be quite impossible. The examination may be facilitated by drawing forward the uvula and soft palate with a hook.

A complete rhinoscopic image is represented in Fig. 14. A picture such as this is got by combining the views obtained, by moving the mirror into various

positions, and inserting it now on one side, and now on the other, of the uvula.

In addition to the difficulty caused by the limited space, between the soft palate and the posterior wall of the pharynx, in which the rhinal mirror has to be introduced, other obstacles may be placed in the way of the rhinoscopist by irritability of the palate and the posterior pharyngeal wall, or by enlargement of the tonsils and uvula.

FIG. 14.



RHINOSCOPIC IMAGE.

- | | |
|------------------------------|--------------------------------|
| 1. Septum. | 7. Inferior meatus. |
| 2. Superior turbinated bone. | 8. Orifice of Eustachian tube. |
| 3. Middle turbinated bone. | 9. Fossa of Rosenmüller. |
| 4. Inferior turbinated bone. | 10. Promontory. |
| 5. Superior meatus. | 11. Wall of naso-pharynx. |
| 6. Middle meatus. | 12. Velum palati. |

In all cases of rhinoscopic examination, the patient should be instructed to breathe through the nostrils, as this causes the uvula to fall forwards. It is almost impossible in rhinoscopy to avoid sometimes touching the posterior wall of the pharynx, and causing retching; but the tendency to this may be overcome by the patient by continued practice and frequent examination.

In order to complete our acquaintance with the condition of the naso-pharyngeal space, digital examination

may be employed, a finger being introduced behind the soft palate, and turned upwards to explore the post-nasal space. In this manner, the situation, size, &c., of polypi, granulations, and other abnormal conditions may be ascertained.

I have now described the methods of examination of the pharynx, larynx, nares, and naso-pharynx; but in the investigation of diseases of the throat as of other regions, it must not be forgotten that we must enquire into the existence of other than local symptoms and signs. The family history, general health, circulation, respiration, digestion, and nutrition, must all be investigated; and the lungs, heart, and other organs carefully examined. It must never be forgotten that local disease often has a constitutional origin, and if we try to form a diagnosis, on which to base our treatment, simply from an examination of local signs, we shall often find ourselves at fault.

CHAPTER II.

THE GENERAL PATHOLOGY OF THROAT DISEASES.

The pathological changes to which the structures of any region of the body are liable depend, of course, upon the nature of those structures. In the throat and naso-pharynx, several anatomical structures are present—muscles, vessels, nerves, lymphatics, mucous membrane, glands, cartilages, and bones. These are subject to the same morbid changes as they are liable to in other parts of the body, modified, or perhaps aggravated in some instances, by their situation and relative position, which renders them obnoxious to influences which would not have the opportunity of affecting the same structures in other parts of the body. The mucous membrane of these parts may present appearances due to an increased (hyperæmia), decreased (anæmia), or perverted (paræmia), condition of the blood supply. These changes are evidenced by the alterations in colour produced in the part, the tint of the mucous membrane being either deepened, lessened, or altered. Inflammation of the mucous membrane may also occur, and may be either catarrhal, fibrinous, or croupous. Inflammation of mucous membrane causes increased redness, heat, and swelling of the part, and also gives rise to exudation, the form of exudation being distinct in each variety of the inflammation. *Catarrhal inflammation*, which is common in the mucous membrane of the pharynx, larynx, nose and naso-pharynx, is characterised by an increased secretion of mucus with proliferation of the epithelium, and increased production of mucus corpuscles, which constitutes the *catarrh*. When the catarrh becomes chronic, the sub-epithelial tissue becomes more involved. This

tissue, becoming infiltrated and fibrillated, cause thickening and induration of the membrane, the pressure of which causes atrophy of the glands it contains; the lymphatic structures at the same time enlarge, giving the membrane a granular appearance, such as is seen in follicular pharyngitis. These enlarged lymphatic structures may ulcerate.

Fibrinous inflammation produces an exudation of the fibrine of the blood, resulting in the formation of false membrane. This form of inflammation usually results from some injury to the mucous membrane, such as in the throat is often produced by the attempts of children to drink boiling water from the spout of a tea-kettle.

Croupous inflammations are characterised mainly by a "peculiar metamorphosis of the epithelial cells, which become enlarged, and are then converted into a kind of fibrinous material. They occur in croup and diphtheria." (Green's Pathology, 4th edit., p. 308.) Foreign authors draw a distinction between croupous and diphtheritic inflammation and exudation. Mandl,* to whose pages I am indebted for much of the contents of this chapter, says:—"Croupous exudation greatly resembles coagulated fibrine, and is called croupous membrane. This exudation is frequently met with on the pharyngo-laryngeal mucous membrane; it follows the shape of the surface on which it is situated, is membranous or reticular, yellowish-white, slightly transparent and elastic; on tension, however, it breaks and does not draw out in filaments. Acetic acid causes it to swell like fibrine. After some time it becomes deeper in colour, more yellow, less elastic, and may be detached from the mucous membrane, which is hyperæmic, but little swollen.

* Mandl. *Maladies du Larynx, &c.*, p. 383.

“Diphtheritic exudation occupies more especially the interstitial spaces of the tissues affected; hence occurs compression of the vessels and gangrene of the tissue. The exudation—only a small portion of which appears on the surface of the mucous membrane—is of fibrine, more or less modified; it takes place beneath the epithelium, since we find this on the free surface of the exudation, where it perishes.”

Regressive changes may occur in these exudations, giving rise to the production of new formations, either by regeneration or by adhesive inflammation.

Adhesive inflammation may take place when two surfaces of mucous membrane from which the epithelium has been removed, and which are covered with fibrinous exudation, are in contact or immediate contiguity, and this is not infrequent in the pharyngo-laryngeal region, stenosis of the glottis after inflammation being an example.

Degenerations of various kinds, albuminous, fatty, lardaceous, colloid, diphtheritic, and caseous or tuberculous, may occur in the pharyngo-laryngeal regions. *Fatty degeneration* takes place when the cartilages of the larynx and trachea ossify; it also occurs in these cartilages after chronic inflammation, and in the epithelial cells of the mucous membrane and in those of the glands in acute and chronic catarrh.

Lardaceous degeneration has been found in Goitre, and according to some authors, in the exudation of diphtheria. *Colloid degeneration* also occurs in Goitre. *Caseous and tuberculous degeneration* occurs in the pharynx and larynx in cases of pharyngeal and laryngeal tuberculosis. The tubercular matter forms greyish or yellowish masses, homogeneous, dry and anæmic, of a caseous consistence, breaking down into ulcerations. Tubercle is more common in the larynx than in the

pharynx, though when it occurs in the latter situation the fatal issue will probably be nearer at hand.*

Calcareous infiltration is often met with in the cartilages of the larynx as a sequel of inflammation and ulceration. Retention of secretion in the salivary glands, the acinous glands of the pharynx, or in the crypts of the tonsils, may also give rise to the formation of irregular calcareous concretions.

The laryngeal cartilages are not unfrequently the seat of *necrosis*, but *gangrene* usually occurs in the tissues of these regions only as the result of deep burns, severe wounds, or cancerous ulceration.

Hypertrophy of the tissues of these parts may occur, and may be either general or partial, either diffuse or circumscribed, assuming the form of tumours and polypi. In some chronic catarrhal affections of the nose, pharynx and larynx, the layers of mucous membrane become considerably hypertrophied, causing great thickening. In the nasal passages especially this thickening of the mucous membrane assumes such form and dimensions as sometimes to be mistaken for polypus.

Hypertrophy of the mucous glands rarely occurs without concurrent colloid degeneration. In the trachea, the glands sometimes hypertrophy and then degenerate into cysts. In the larynx, hypertrophy of the mucous glands may cause atrophy of the arytenoid cartilages. By hypertrophy of the mucous glands in a projecting form may be produced a mucous polypus, round or oval, soft, sessile, or pedunculated, of varying size, composed of mucous glands, and covered with epithelium, similar

* For an admirable résumé of what is known respecting tubercle in the pharynx, enriched also by original observations, see a thesis, "De la Tuberculose du Pharynx," par Dr. J. Henri Barth. Paris: Asselin and Co. 1880.

to that of the mucous membrane, from which it springs.

The adenoid tissue of which the conglomerate glands, the lymphatics, tonsils, follicles of the larynx, and of the root of the tongue are composed, may be hypertrophied. The hypertrophy of lymphatic glands may be primary or secondary, as in the case of the sub-maxillary gland in tonsillitis. In the tonsils themselves, the hypertrophy may affect either the fibrillary stroma, or the parenchyma of the gland. The affection known as granular sore throat is constituted by a hypertrophy of the glands on the posterior wall of the pharynx. The hypertrophy may affect either isolated glands or a large number. Hypertrophy may also affect the ossified cartilages, either wholly or in part, forming exostoses. The cartilages may also be hypertrophied without being ossified, cartilaginous excrescences or ecchondroses being formed. Hypertrophy affecting the epithelial structures is found in the papillæ of the tongue, on the epiglottis, and the superior folds; hypertrophied epithelium is also found covering the tumours called papillomata.

Polypi.—The circumscribed tumours called polypi in the nasal and naso-pharyngeal regions may be gelatinous, fibro-cellular, fibrous, or malignant. In the nose, the more common forms are the gelatinous and fibro-cellular; and the most usual seat of origin is the posterior portion of the middle turbinated bone. In the naso-pharyngeal region, however, the fibrous form of polypus is more frequently met with, growing from the roof of the pharynx and the posterior nares, and originating from the periosteum. Adenoid vegetations occur in the naso-pharyngeal region, though they would seem to be more common abroad than in this country. They consist of a morbid growth of the closed glands of the region. Meyer, of Copenhagen, made a thorough study

of them, and an admirable and exhaustive account of them has been written by Dr. Lowenberg, of Philadelphia. A translation of whose work, by Dr. Macnaughton, has appeared in the *Medical Press and Circular* for 1881.

Polypi of the larynx are of various kinds, fibro-cellular, myxomatous, papillomatous, adenomatous, &c., or may consist of a simple hypertrophy of the mucous membrane. These will be described more in detail when speaking of the separate affections of the larynx.

Tumours of these regions may be cancerous, osseous, or cartilaginous in their nature. Papillomata, fibrous, and fatty tumours are also met with in the pharynx. Cystic tumours are not infrequent in the throat and adjacent parts, and are usually caused by accumulation of fluid undergoing mucous or other changes. In the thyroid gland, dilatation of the closed follicles causes their development; in the parathyroid glands, and the submaxillary glands, they are due to occlusion of the excretory ducts of the glands.

Cancer occurs in the pharynx, naso-pharynx, tonsils, larynx, and trachea. In the pharynx the variety of cancer which is generally found is the scirrhus. Pharyngo-laryngeal cancer is usually of the epitheliomatous variety. In the tonsils, encephaloid is the more frequent, but scirrhus is also found; cancer of these organs is, however, rare.

In the larynx, malignant tumours occur, belonging to both the carcinomatous and the sarcomatous class. Of cancer, the variety most commonly met with is the epithelioma. Mackenzie* had, out of 53 cases of primary laryngeal cancer, 45 of epithelioma (adenoid) 2 of scirrhus, and 6 of encephaloid. Sarcoma is rare in the larynx. In the trachea, malignant disease may occur of either a sarcomatous or carcinomatous

* Diseases of Throat and Nose, vol. i, p. 339.

nature, though both are very rare, in this situation.

Syphilis.—The effects of syphilis are manifested with great force in the throat; indeed, in by far the majority of cases of constitutional syphilis, the throat suffers from its ravages. Primary chancre is not common in the pharynx; when it does occur the tonsil is its usual seat. The phenomena of the secondary and tertiary periods, however, are common in the pharynx, the secondary symptoms exhibiting themselves as erythema and mucous patches, the tertiary as ulcerations, either superficial or perforating, and gummata.

Syphilis also affects the structures of the nasal and naso-pharyngeal regions, causing ulceration, ending in caries and necrosis of the bones of these parts.

In the larynx, primary syphilitic manifestations are not found. In secondary syphilis of the larynx, there are found condylomata, erythema, superficial ulceration, and obstinate congestion of the mucous membrane. The tertiary manifestations of syphilis in the larynx include gummata, ulceration, and stenosis from cicatricial contraction. The ulceration often extends deeply, and causes perichondritis, with caries of the cartilaginous framework of the larynx.

The hereditary form of syphilis manifests itself in the larynx as well as the acquired. It has been seen in children as young as two months old. (Frankel.)

Tubercle.—As has been already mentioned, tubercle may be deposited in the throat, though it is apparently always secondary to its occurrence in the lungs. Tubercle in the pharynx first shows itself in the form of small, acuminate papillæ on the velum palati and pillars of the fauces, more rarely on the posterior wall of the pharynx. These small projections increase in size, become united, and form ulcers. The tonsils are often affected, and the tubercular ulcers may be developed in the vault of the pharynx and the neighbourhood of the

pharyngeal orifices of the Eustachian tubes. Tuberculosis of the pharynx may occur secondarily to that of the larynx, or independently of it.

In the larynx, tubercular deposit is common, occurring in about 30 per cent. of cases of pulmonary phthisis. Whether tubercle is ever deposited in the larynx before the lungs have become affected, is a point which has not yet been satisfactorily decided. The parts of the larynx most affected are the ary-epiglottic folds, the epiglottis, and the vocal cords. "Ulceration is the common sequel of the deposit of tubercle in the mucous membrane of the larynx." (Mackenzie.) Perichondritis frequently occurs.

The eruption of *Herpes* may occur in the pharynx occupying the velum, fauces, and tonsils. The eruptive vesicles may disappear by absorption or may ulcerate.

Some observers also affirm the existence of a herpetic laryngitis, but the occurrence of a true herpes of the larynx appears very doubtful.

The *Rheumatic diathesis* gives rise in some persons to a peculiar form of sore throat, which is characterised by acute pain, and is generally accompanied or succeeded by rheumatic pains in other parts of the body. The rheumatic diathesis is by some authors (Lennox Browne especially) considered to have an intimate causative relation to tonsillitis.

There is also a variety of sore throat which is apparently connected with gout, in some cases of which the gouty symptoms alternate their manifestations between the pharyngo-laryngeal regions and the great toe.

The eruptive fevers, measles, scarlatina, and small-pox manifest certain phenomena in the pharynx and larynx. In *Measles*, the pharynx suffers little, though occasionally false membrane may form in this region; but in the larynx there may be either a catarrh, or a croupy affection with development of false membrane.

In *Scarlet fever*, the throat often bears the brunt of the disease apparently, the pharynx, tonsils, submaxillary and parotid glands being all implicated. From the pharynx, the affection not unfrequently extends to the larynx. In the malignant form of scarlet fever, a secondary diphtheria of a serious kind, resulting in gangrene, is not seldom developed. In *Rötheln*, the throat is often considerably affected, severe inflammation of the tonsils, uvula, velum, &c., occurring, and involving the neighbouring glands.

In *Small-pox*, pustules resembling those on the skin may be developed on the mucous membrane of the pharynx, and extend thence to the larynx, trachea, and bronchi. Ulceration may occur, and even proceed to the extent of perichondritis and necrosis of the laryngeal cartilages.

The vesicles of *Chicken-pox* may also be seen in the pharynx and larynx, and a good example is given by Lennox Browne in the illustrations of his work.

Typhoid fever.—Both in the pharynx and larynx two forms of affection are met with in typhoid fever. The first is an inflammation of a low type, which, in the larynx, if it persist, is characterised by a great tendency to ulceration, causing perichondritis, caries, and necrosis of the cartilages. The second is a secondary diphtheritic inflammation. The throat is far less frequently affected in typhus than in typhoid.

Lupus.—An affection similar to the lupus which affects the skin of the nose may occupy the larynx and pharynx, giving rise to ulceration, sometimes extensive, followed by cicatrisation.

Lepra.—Small papillary vegetations about as large as a pin's-head, identical with the tubercles of lepra, may occur in the pharyngo-laryngeal region of persons afflicted with leprosy in other parts.

Erysipelas not unfrequently attacks these regions

either primarily or by extension, they being always more or less congested. The extension of the erysipelatous inflammation from the face to the throat, may take place through the nasal fossæ and naso-pharyngeal regions, or through the lips and mouth. Spreading of erysipelas from without to the throat is a grave prognostic symptom. The manifestations of erysipelas in the pharyngo-laryngeal region vary from a simple redness to a gangrenous inflammation. The larynx is usually affected secondarily from the pharynx, though the erysipelas may appear first in the former, while the latter is untouched.

Diphtheria.—The pathology of this disease will be considered with its diagnosis and treatment.

Nervous affections of the Pharynx and Larynx.—The nervous apparatus of the throat may be affected by disease due to either central or local causes. The most important affections are those involving the nerves of motion. In the pharynx, paralysis of the palate and adjacent regions is common after diphtheria, and may also occur after other forms of angina. In the form of paralysis known as glosso-labio-laryngeal, the muscles of the tongue, palate, and pharynx, and the orbicularis oris are paralysed. The lesion in these cases is central, and appears to consist of atrophy and destruction of the nerve cells at the origin of the facial, hypoglossal, pneumogastric, and spinal accessory, in the medulla and upper part of the spinal cord.

In facial paralysis, the palate sometimes participates in the loss of power.

A paralysis of the muscles of the palate and orifices of the Eustachian tubes is described by Dr. Woakes*

* Deafness, giddiness and noises in the head. Second edition, p. 65.

as due to loss of vaso-motor nerve power, affecting one or more ganglia of the sympathetic.

Paralysis of the motor nerves of the laryngeal muscles may occur, and may be due to either central or peripheral causes. The paralysis may affect either the adductors, or the abductors, of the vocal cords, and may be bi-lateral or uni-lateral. Bi-lateral paralysis of the adductors, the crico-arytænoidei laterales, and the arytænoideus, is generally caused by hysteria and debility, but it may also follow congestion of the larynx. Uni-lateral paralysis of the adductors may be due to local injury, to the effects of chronic poisoning by lead or arsenic, or to cerebral disease. Pressure on the pneumogastric nerve or its recurrent branch may cause it, or it may occur as a sequel of diphtheria.

Paralysis of the abductors, the crico-arytænoidei postici, is more usually due to central causes, though pressure on the pneumogastric, or recurrent, nerves may produce it. This pressure may be caused by cancer of the thyroid, simple goitre, scrofulous disease of the bronchial glands, œsophageal cancer, aneurism, &c.

The sensory nerves of the throat may also be affected, and we may have anæsthesia, hyperæsthesia, or paræsthesia of either the pharynx or larynx.

CHAPTER III.

THE LOCAL TREATMENT OF THROAT DISEASES.

Into the general and constitutional treatment of throat diseases I shall not enter in this chapter, but shall indicate later, under each disease, the general methods of treatment to be employed.

My object now is to describe the methods adopted for acting locally on these regions, so that they may be easily referred to later on.

Remedies employed for local action in diseases of the throat and naso-pharynx are used in the form of douches, inhalations, insufflations, gargles, lozenges, and caustics and pigments for application to the affected parts by brushes and other instruments. Operative procedures are called for in some cases, and the instruments required will be described, and some of them figured.

Douches.—These are employed chiefly in diseases of the nasal and naso-pharyngeal passages, for the purpose of cleansing away secretion, and bringing the mucous membrane into a more healthy condition. There are two kinds of douches, the anterior nasal douche, known also as Thudichum's and Weber's douche, and the posterior nasal douche, which has long been in use in America, but was, I believe, first brought prominently before the profession in this country by Mr. Lennox Browne. The anterior nasal douche (Fig. 15) consists essentially of an india-rubber tube, with a soft rubber nozzle for insertion into the nostril. The other end of the tube being placed in a vessel, containing the fluid used for the douche, and raised slightly higher than the patient's head, the fluid will flow as through a syphon and pass into the nostril. If the patient hold the head slightly forwards, and keep the

mouth open, the fluid flowing in through one nostril will pass to the back of the nose, round the septum, and will flow out by the other nostril, carrying with it any secretion it meets on the way. The strength of the current is regulated by the height of the vessel above

FIG. 15.



ANTERIOR NASAL DOUCHE.

the head ; care must be taken not to put the vessel too high. As a rule, all nasal douches should be used warm or tepid. Simple water should not be employed as it is irritating to the mucous membrane ; the addition of a little common salt renders it non-irritating.

FIG. 16

POST-NASAL
SYRINGE.

The posterior nasal douche is applied by means of the post-nasal syringe (Fig. 16). The syringe being filled with fluid, the nozzle is inserted behind the soft palate, and the patient bending the head forward, the fluid is ejected. It is forced from the nozzle in several small streams, and after thoroughly irrigating the post-nasal regions, flows out through the nostrils. This instrument is, I think, more efficacious than the nasal douche in cleansing the naso-pharyngeal space, and it is said not to be so liable to be forced into the Eustachian tubes and cause aural trouble as the anterior douche.

Inhalations.—Inhalations are of various kinds, either of vapour, of atomised fluids, or dry inhalations.

Those in most common use in this country, and probably the most generally valuable, are inhalations of medicated steam. These may be taken either from a common jug, some means being adopted to confine the vapour, or from one of the numerous forms of inhaler. Of these, the most serviceable are Corbyn's double-valve inhaler, the Eclectic inhaler, Martindale's portable inhaler, and Bullock and Reynolds's hospital inhaler, the two latter, especially, being both efficient and cheap. The temperature at which vapour inhalations are taken varies from about 120° to 150° F. For ordinary inhalation for the throat, the prescribed quantity of the remedy being added to a pint of water at the temperature ordered, the

vapour which arises should be inhaled by full but not forced breathing. The vapour having been inhaled by the mouth should be exhaled by the nose, the process being repeated about six or eight times a minute. For nasal inhalation, a nasal piece must be put on the inhaler, or the orifice narrowed. This being inserted into one nostril, and the other nostril and the mouth being closed, the vapour is drawn into the nose and exhaled by the mouth. In cases where pharyngeal catarrh has extended to the Eustachian tubes, it may be necessary to force the vapour into those passages, by what is known as Valsalva's method. For this purpose, while ordinary throat inhalation is being carried on, about once in each minute, a mouthful of the vapour being taken, the mouth should be closed, the nostrils compressed by the thumb and finger, and an attempt at forcible expiration made; this will force the vapour through the Eustachian tubes towards the ears.

The best time for taking vapour inhalations is shortly before a meal, and it is advisable not to go out of doors for at least half-an-hour afterwards.

A means by which the air inspired may be impregnated with volatile disinfectant, antiseptic and other remedial substances is found in the forms of respirator inhaler devised by Dr. W. Roberts, of Manchester, and Dr. Coghill, of Ventnor.

An advantage of this method of inhaling is that it can be employed continuously and with no effort to the patient. A small quantity of the remedy being placed on the tow or cotton wool contained in the instrument, the latter is then worn in the same way as the ordinary respirator. This method of inhalation I have seen used with great benefit in some cases of laryngeal phthisis, and patients, after the first day or two, *express their appreciation of it.* Inhalation by

this means may be taken all day, while the patient is employed at his usual avocations, or walking about, and may be continued during the night, the patient sleeping with the respirator on, thus continually breathing a medicated atmosphere.

Atomised or spray inhalations are much more employed abroad than in this country. For pharyngeal affections, however, they are of great value, though I do not agree with those who advise them in diseases of the larynx and trachea. The contact of the spray with the vocal cords usually, in my experience, sets up violent spasmodic cough, and I believe the spray rarely, if ever, gets below the glottis. For laryngeal affections I much prefer inhalations of medicated steam, or of volatile substances by the respirator inhaler.

For generating spray for atomised inhalation, many instruments have been devised. The best are Dr. Clark's handball spray producer, Corbyn's throat spray, and Siegle's inhaler.

Fuming inhalations are sometimes of value in spasmodic difficulty of breathing from asthma, or spasm of the abductors of the vocal cords. They are obtained by igniting paper steeped in a solution of nitrate of potash, and inhaling the fumes which arise.

Insufflations.—The insufflation of powders is a valuable method of treatment in some diseases of these regions. In the nasal region the powder of tannin is sometimes used as a desiccating agent for drying up the smaller varieties of polypi. In the pharynx, for application in some forms of ulceration powders are also useful. In the larynx, in the thickening and ulceration of the epiglottis which accompanies tuberculous disease of this region the insufflation of powders containing morphia often gives great relief. Various instruments have been devised for the application of powders, Rauchfuss's insufflator, or some modification

of it, being the best. The insufflating force may be applied either by an india-rubber ball, or a tube through which the operator blows. The latter method is preferable, as when pressing the ball to eject the powder it is difficult to avoid somewhat deflecting the point of the instrument, thus preventing the accurate application of the remedy to the desired spot.

Gargles.—The employment of gargles as a method of treating throat diseases has been in vogue from time immemorial. For affections of the palate, fauces, and pharynx, gargles are valuable, but they are of little use when the disease is situated lower down, though in some rare cases patients may be found who can, by great practice, allow gargles to enter the larynx. There are some people who cannot gargle, and for them, and for children, it is a good plan, when the remedy is one which may be swallowed without injury, to mix the drug, in powder, with white sugar, and placing it on the tongue, allow it to melt slowly, and be swallowed.

Lozenges.—By the use of lozenges we obtain both a local and a constitutional effect. They are frequently of great value as astringents, sialagogues, and sedatives. Mr. Cooper, of Oxford-street, has introduced a form of effervescing lozenge which is both agreeable and useful. The medicated pastilles made by Messrs. Allen & Hanbury, at the instance of Dr. Prosser James, are a very pleasant and elegant form of lozenge, in many respects better than either the hard lozenges of the British Pharmacopœia, or those made up with fruit paste. Wyeth's compressed tablets of chlorate of potash, chloride of ammonium, borax, &c., are in many cases preferable to lozenges, as they contain nothing in addition to the drug.

Pigments.—For the application of remedies directly to the larynx the use of a laryngeal brush is the most efficacious method. By its means we are enabled to

apply solutions of an astringent, caustic, sedative, or other nature, directly to any ulcerated or diseased spot of the larynx, the brush held in the right hand being guided by the laryngeal mirror held in the left. The laryngeal brush as generally used consists of a camel-hair brush attached to an aluminium stem bent at right angles, and inserted in a wooden handle. (Fig. 17.)

These brushes are made with the bend at varying distances from the extremity, so as to suit different cases. The same instrument may be used for applying pigments to the nasal, naso-pharyngeal, and pharyngeal regions, and the aluminium wire may be bent to any suitable angle. Dr. Smyly, of Dublin, advocated the use of cotton-wool instead of a camel-hair brush, and I usually now use this myself. It has the advantage of cleanliness, a fresh piece of cotton-wool being used for every application. It may be easily made by removing the brush from the stem (on which it screws), and twisting around the latter a little piece of cotton-wool, care, of course, being taken that it is attached firmly. A very little practice will enable one to twist the wool in a suitable shape. (Fig. 18.)

For the application of caustic the same aluminium wire stem will be available. A little nitrate of silver being melted over a spirit lamp, the end of the wire should be dipped in. A small portion will adhere to the end of the wire, and on cooling will form a bead of caustic, which may be applied where desired.

Besides these forms of local treatment some cases of throat disease are benefited by treatment of the throat externally. Local external treatment may be carried out by blisters, sinapisms, ointments, pigments, as of iodine, &c. The wet compress is a very useful application for the throat. It is made of three or four folds of linen wrung out of cold water and applied round the

covered with a piece of flannel and of oil silk or -percha tissue.

FIG. 17.



LARYNGEAL BRUSH.

FIG. 18.



COTTON-WOOL BRUSH.

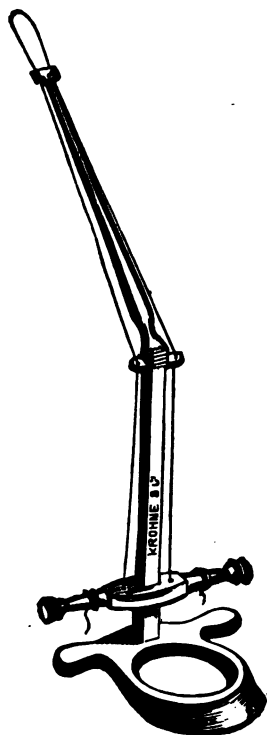
Hypodermic injections are sometimes employed in these regions in cases of neuralgic pain, and in hypertrophy of the thyroid.

Operations.—We now come to operative procedures. In the naso-pharyngeal and nasal regions the principal operation to be performed will probably consist in the removal of polypi, and this is frequently a very troublesome and tedious process. It may be performed by means of the ordinary familiar polypus forceps, or better by the instrument represented in Fig. 19, known as Wilde's polypus snare, a modification of the *écraseur*. Recently the galvano-cautery has been much used for the removal of polypi from the nasal and adjacent regions, and for the destruction of syphilitic ulceration of the palate, fauces, and pharynx, but I cannot enter into a full description of this instrument in this little work. The most portable and convenient forms of galvano-cautery are those devised by Lennox Browne, and Voltolini, both of which may be procured of Messrs. Krohne & Sesemann. Polypi seem decidedly less prone to recur after removal by the galvano-cautery than after simple evulsion or removal by the snare, and the pain caused is very slight.

Other operations in these regions are removal of the tonsils and uvula, and of laryngeal growths.

For the performance of tonsillotomy the instrument shown in Fig. 20, and generally known in this country as Mackenzie's, answers all purposes, being simple and efficacious, not requiring the use of a gag, and never taking off more than is advisable of the gland. As a rule no forceps need be used with it, but an assistant should hold the patient's head, and, by pressing a finger behind the angle of each jaw, push forward each tonsil into the mouth in turn. If both tonsils require to be removed, it is better to do them at one operation. One having been excised, and the instrument with-

FIG. 19.



WILDE'S SNARE.

FIG. 20.



MACKENZIE'S TONSILLOTOME
AS HELD IN POSITION.

drawn, it should immediately be reintroduced on other side, and the other tonsil removed. The bleeding is usually slight. If it does not stop quickly, little cold or iced water, or the Gargarisma Acidi T

FIG. 21.

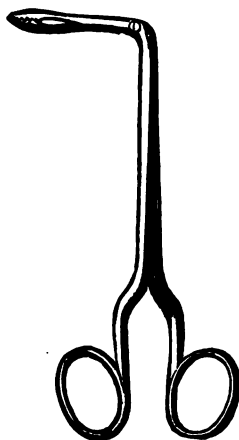


UVULA SCISSORS.

nici et Gallici of the Throat Hospital Pharmacopoeia may be sipped, and slowly swallowed.

For removal of the uvula, the scissors shown in Fig. 21 should be used. The uvula should be drawn

FIG. 22.



LARYNGEAL FORCEPS.

forward with a long pair of forceps, and cut off with the scissors, this method being preferable to the use of any of the more complicated forms of uvulatome found at the instrument makers.

For the removal of polypoid growths, &c., from the larynx, various forms of forceps have been devised. One of these is represented in Fig. 22. The exact position of the growth having been ascertained by repeated laryngoscopic examinations, and the patient educated to bear the presence of instruments in the larynx, the forceps (previously warmed) is introduced under good illumination and with the laryngeal mirror, and the attempt made to seize the growth and remove it. Various forms of *écraseur* and of cutting and crushing instruments may be required in individual cases, and will be found described in the more elaborate works.

With regard to the cases in which the forceps and the *écraseur* should respectively be employed, Dr. G. Johnson* says, "When the tumour is of large size and has a broad base, as in the first and second cases here recorded, the laryngeal forceps is, perhaps, a better instrument than the wire *écraseur*. I found the forceps very useful in the first two cases, (where the growth was of considerable size), but for the removal of so small a growth as that in the third case, I much prefer the *écraseur*; and I doubt whether this small growth could have been safely removed by the forceps. The *écraseur* has this obvious advantage over any form of laryngeal forceps—that, unlike them, it very rarely tears the mucous membrane, or seizes any other object than the growth to be removed. It is a perfectly safe and harmless instrument, whereas, with the forceps, an arytenoid cartilage might be seized and broken or dislocated."

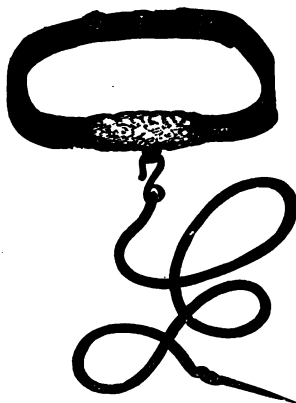
* *Lancet*, January 22, 1881.

It is frequently desired to apply an electric current to the larynx. This is best done by means of the instruments shown in Figs. 23 and 24. The former re-

FIG. 23



FIG. 24



NECKLET.

LARYNGEAL ELECTRODE.

presents the electrode which is applied to the larynx, the current only passing when the little lever is pressed down. The latter is a necklet, which is fastened round

tient's neck, the sponge (previously slightly tied) being placed over the larynx. The cords are connected with the respective poles of the or machine generating the current.

odes have also been devised in which the two are united in one handle.

heotomy, &c.—In a small work like this I cannot mention this operation, which will be clearly described in good text-books of surgery monographs, such as those of Parker* and n;† while other operations, such as extirpation larynx, &c., belong too much to the domain of elaborate and purely special works to require notice here.

heotomy in Laryngeal Diphtheria. By R. W. Parker.
: D. Bogue. 1880.)

heotomy. By Pugin Thornton. (London: J. & A.
L.)

CHAPTER IV.

DISEASES OF THE NASO-PHARYNX.

The affections of the naso-pharynx assume somewhat more than merely local importance from the relations which the cavity bears to the nose, on the one hand, and to the ear on the other, from which it results that disease of this region impedes such important functions as those of hearing, respiration, and speech.

Diseases of the naso-pharynx are by no means infrequent, and of late years, owing to improved means and methods of investigation, have received considerable attention.

Owing to the continuity of the mucous membrane, and the intimate connection of this region with the neighbouring parts and cavities, disease in the naso-pharynx is frequently dependent upon, caused by, or concurrent with, similar affections of the nose, pharynx, ear, or larynx; while, on the other hand, disease of any of these regions may have originated from an affection primarily situated in the naso-pharynx.

The nose being the natural channel for respiration, the naso-pharynx, of course, forms a part of the natural respiratory tract; anything, therefore, which causes swelling and alteration in form of the passages will have a corresponding effect on the free passage of air to the lungs, and will impede proper nasal breathing. From the naso-pharynx also passes the Eustachian tube directly to the ear, forming a passage for the air to the tympanum, so that the atmospheric pressure on the two sides of the drumhead may be equalised. "Impediment or abolition of this function of the Eustachian tube (closure from swelling, or accumulation of secre-

tion, insufficiency of the muscles) produces primarily mechanical disturbance (rarefaction of the air, sinking in and increased tension of the tympanic membrane, and the chain of aural bones, and with this, impairment of hearing, subjective manifestations of sound), and consecutively anatomical alterations (hyperæmia, dropsy, and swelling *ex vacuo*) in the cavity of the tympanum.* Into the question of the aural complications, the limits of this work will not allow me to go, but they will be found fully treated of in text-books of aural surgery, as Politzer, Troeltsch, &c.

I now, therefore, proceed to a very brief consideration of the chief affections of the naso-pharynx, seriatim, excepting croup and diphtheria, which will be treated separately.

Catarrh of the Naso-Pharynx.

Post-Nasal Catarrh.

One of the commonest affections of the naso-pharynx is catarrh, which may be either acute or chronic.

Acute catarrh usually accompanies a like affection of some other portion of the air passages, and it generally originates in "a cold."

There is produced great swelling and hyperæmia, which is especially evident about the pharyngeal tonsil and the orifices of the Eustachian tubes, and hæmorrhage is not infrequent. The mucous membrane is thickened in proportion to the intensity of the affection. The follicles are often much swollen, causing a granular appearance similar to that to be described as granular pharyngitis, and these follicles sometimes disintegrate, causing small ulcers.

* Wendt. Ziemssen's Cyclopædia. Vol. VII., p. 15.

The glandular secretion is increased, and the mucous membrane becomes covered with a tenacious, yellowish, grey exudation.

The chief subjective symptoms complained of are those of obstructed nasal respiration, dryness of the back of the throat, alteration of the voice, and a constant hawking in the endeavour to clear away the secretion; if the ears be affected, there will be deafness, tinnitus, and probably some pain. On examination, the mucous secretion may be seen hanging down from behind the soft palate and on the posterior wall of the pharynx. The rhinoscope will show the reddened, hyperæmic, and swollen state of the parts, and digital examination may enable the observer to detect a thickened and granular condition.

The course of the affection may go on to a more or less speedy return to the normal condition, or it may pass into the chronic form, to be presently considered. Often, however, after the naso-pharyngeal trouble has apparently disappeared, the auditory apparatus may remain affected.

With regard to treatment, the employment of the nasal douche, either anterior, or posterior, will be of value, solutions of common salt being, perhaps, the most useful. Astringents are to be used only in the chronic form. Attention should be early directed to the ear, and inflation by Politzer's method practised regularly, as, by this means, the consequence of protracted rarefaction of the air in the tympanum may be warded off.

Inhalations of steam, either plain or medicated, are of value in relieving the dryness and reducing the swelling; the inhalation should be taken by the nose as well as the mouth, and when the auditory apparatus is affected, the vapour should be forced through the Eustachian tubes (see p. 35).

As to general measures, those usually adopted in catarrhal affections should be here employed. Free diaphoresis should be induced, and vapour baths are often of value.

The tendency to naso-pharyngeal catarrh may be combated by preventive measures, which will consist in the avoidance of sudden changes of temperature, of residence in close and unhealthy atmospheres, &c.

Chronic catarrh.—This, like the acute form of the affection, occurs less frequently alone than in connection with a similar condition of the nose, pharynx, and middle ear. More usually than not it is consecutive to an acute catarrh, but it may come on gradually and insidiously, without the patient ever having suffered from the acute form, or it may be connected with some constitutional condition or diathesis, as tubercle or syphilis.

The condition produced by chronic catarrh resembles that of the acute form in a somewhat modified degree; hyperæmia, perhaps hæmorrhage, swelling and thickening of the mucous membrane, enlargement of the follicles, increased secretion from the mucous glands, which often assumes a very dense, tough consistence, and the occasional formation of cysts.

The symptoms, of course, vary in severity in proportion to the amount of thickening and secretion; the tenacious masses hanging about cause impediments to nasal respiration and affect the speech, preventing the proper pronunciation of so-called nasal sounds. The patient complains of weight in the head, a feeling of stuffiness and of the constant presence of a foreign body at the back of the throat, which he is perpetually endeavouring to remove by hawking. The symptoms are aggravated in the morning, because the secretion has collected during the night, and the patient often wakes in a miserable state of stuffiness, dryness, and headache.

The affection may last for an almost indefinite time with occasional intervals of aggravation or improvement, the latter being usually, however, only transitory, the patient relapsing into his usual pitiable condition. Sometimes, if the affection be allowed to take its course unchecked, hypertrophic changes take place in the naso-pharynx itself, and the middle ear becomes seriously affected, from the continued interference with the proper ventilation of the tympanic cavity.

The hypertrophy may be either general or partial, and is more especially evident in the adenoid or cytogenous tissue, though there is also an increase of the connective tissue. General hypertrophy causes great increase in the thickness of the tissues, and diminishes in size the naso-pharyngeal cavity, thus causing considerable interference with speaking, breathing, and hearing.

When the hypertrophy is partial and circumscribed, it assumes the form of distinct growths of adenoid tissue. These "adenoid vegetations" were first clearly described by Meyer, of Copenhagen, and have since been studied by Loewenberg, of Paris,* whose work contains a very full account of them, especially in respect to their effects on the functions. The observations of these authors show that as the result of chronic catarrhal inflammation of the naso-pharynx, there are formed growths containing "besides dilated mucous glands, enlarged closed follicles, and the meshes of the fundamental connective tissue dotted with a large number of the so-called lymph corpuscles. These vegetations are either comb-shaped or tongue-shaped, or have a conical or globular form, and they are usually found on the upper wall of the pharynx, whence they often extend

* *Les Tumeurs Adenoides du Pharynx Nasal*, by Dr. B. Loewenberg. Paris: Delahaye, 1879.

into the choanæ, thus interfering with the permeability of the nasal cavity."*

As I said before, chronic naso-pharyngeal catarrh is essentially a disease of long continuance, its duration if left to itself being literally indefinite. In the majority of cases, however, considerable improvement, if not actual cure, may be effected by suitable treatment, the aim of which, as Wendt says, must be "to secure careful removal of the secretions, decrease in the amount of secretion, and cure of the swollen condition."

To fulfil these indications, the frequent and regular employment of gargles and douches is necessary. With the douche, either anterior or posterior, the latter being, I think, the more efficacious, the parts should be daily cleansed with a solution of salt and water, or bicarbonate of soda, and then astringents may be applied in the same manner, sulphate of zinc ($\frac{1}{2}$ grain to 1 oz.) being a good form. Other solutions for use with the douche are permanganate of potash, tannic acid, and carbolic acid. It should be remembered that Dr. Roosa, and other American authors, have shown that inflammation of the middle ear may be set up by the use of the anterior nasal douche, especially if the current be allowed to flow with much force.

Vapour inhalations are of undoubted value in this disease, especially when the ear is affected, when they should be used by Valsalva's method (see p. 35). The most useful inhalations are those of aldehyde, ammonia, benzoin, creosote, pine oil, and thymol.

The application of remedies directly to the parts by the means of a brush, sponge, or cotton-wool, on a suitably bent stem, is also serviceable. Great thickening of the nasal and naso-pharyngeal mucous membrane

* Politzer—Lehrbuch der Ohrenheilkunde, Vol. i. p. 349
Stuttgart: F. Enke, 1878.

often yields to iodoform, either mixed with vaseline and applied with a brush, or inserted in the form of powder on cotton-wool.

In the treatment of disease of this region, Dr. Woakes has introduced various forms of medicated cotton-wool, which he has found very efficacious. The cotton-wool is saturated with a solution containing the remedy, and is then dried and ready for use. In applying it to the post-nasal space, Dr. Woakes adopts the following plan: "The quantity of wool determined upon is twisted spindle-shaped but loosely upon a piece of thread, the thin ends are brought together and knotted. Thus the spindle-shaped pledget of wool is doubled on itself and secured firmly to the thread, having now a pear-shape, the stalk being represented by the ends of the thread. A probe is engaged in the wool, and made to conduct it along the floor of the nose as far backwards or upwards as may be necessary. The process being repeated on the other nostril, the threads from each are tied into a knot just below the nose, to secure the wool from passing down the pharynx. In the morning, supposing the application to have been made over-night, they can be withdrawn by pulling on the threads."* Iron, tannin, kino, and alum, as astringents; camphor as a stimulant, and iodine and iodoform as absorbent stimulants and antiseptics, are amongst the most useful drugs prepared in this way.

When the thickening of the mucous membrane is very great, and when the so-called adenoid vegetations are numerous and considerable, cauterisation will be required. This may be effected by means of points charged with solid nitrate of silver, though this remedy is not of much use if the growths are of large size.

* Deafness, giddiness, and noises in the head. By E. Woakes, M.D. Second edition, page 180.

They may be removed by means of cutting forceps, such as those devised by Dr. Loewenberg, and figured in his monograph already referred to, but probably the most expeditious and effective method of removal is that by the galvano-cautery.

Constitutional treatment must not be forgotten; for causing the disappearance of growths actually formed, such measures are not of much value, but they are of great use in combating the general catarrhal condition.

General tonic remedies, sea-air, iodide of potassium, arsenic in small doses, chloride of ammonium, are all of value in certain cases, and it may be necessary to ring the changes upon them. Any special constitutional condition must, of course, be met by appropriate measures, and to ensure perfect cure avoidance of exciting causes and careful prophylaxis are essential.

Dry Catarrh.—There is a form of catarrh in the naso-pharynx and pharynx characterised by dryness of the mucous membrane, and known as pharyngitis sicca. It is due to a diminished nutrition of the parts, is more common in old age, and may succeed to a chronic disease of the region. The cause is apparently an atrophy of the mucous membrane, which on examination is seen to be dry, pale, anæmic, and shining. Some dilated and varicose veins may be seen winding upon it. When the affection is in the naso-pharynx, it may extend over the entire cavity, or may be confined to some limited spot, as the tonsil or one or another of the walls. The shrinking away of the tissue in the immediate neighbourhood of the Eustachian orifices, causes these openings to gape.

With regard to the cause, Dr. Shurly, of Detroit,* looks upon atrophic pharyngitis as not "always an ultimate result of chronic pharyngeal catarrh or folli-

* Archives of Laryngology: Vol. I, No. iii., p. 228.

culous pharyngitis, nor an accompaniment of old age, nor a condition depending upon so-called scrofula, but a local change which depends not only upon previous disease of the mucous membrane, but upon some peculiar constitutional defect also." He has frequently found either functional or organic derangement of the stomach, or allied organs, and occasionally a constant tendency to rheumatism.

The symptoms of the affection are often not very well marked. When it is situated in the naso-pharynx, the patient may complain of a sense of discomfort in the head, and dryness of the nostrils. Examination reveals the condition of affairs.

Treatment must be directed to alleviating symptoms, and to the regulation of the *primæ viæ*. Dr. Shurly says special attention must be given to the promotion of the digestion, and assimilation of food. Tincture of calumba and arsenic are useful. When the hepatic and intestinal secretions are perverted, "in addition to general tonic treatment, the use of several large doses of ammonium chloride or sodium phosphate yields excellent results."

Locally the nasal douche should be used with warm milk and water or salt. Dr. Shurly has found galvanism useful in three cases. Anything which tends to keep up the condition, as exposure to impure air, &c., must be avoided.

Abscess of the Naso-Pharynx.

Phlegmonous inflammation may occur in this region, in which case there will be great hypertrophy and swelling, with parenchymatous suppuration. This is usually caused by some traumatic influence as operations, cauterisations, or the application of caustic fluids, as in a case of Wreden's, which was due to

strong liquor ammoniæ having been inadvertently poured into the nose, whence it penetrated to the naso-pharynx and into the Eustachian tube and tympanum of one side.

Suppuration of the naso-pharynx may also occur in the course of small-pox.

The treatment of such conditions must be on the principles applicable to similar states elsewhere, free outlet for pus, when its presence is ascertained, being, of course, an essential and important element.

Tubercle of the Naso-Pharynx.

In cases of tuberculosis, the naso-pharynx, being a portion of the respiratory tract, may, of course, be implicated, and in various ways. In the early stage of phthisis there may be simply anæmia similar to that which is present at the corresponding period in the pharynx and larynx. Some authors affirm that in the earliest stage of phthisis there is always anæmia of the pharyngeal mucous membrane, frequently associated with hyperæsthesia. Concurrently with the deposit and growth of tubercle in the lungs or elsewhere, a catarrhal state of the naso-pharynx is frequent, and may be either simple or follicular, extending usually into the lower pharynx.

This follicular catarrh, which is sometimes accompanied with considerable swelling, may go on to suppuration, the formation of abscesses and ulcers, with ultimately cicatricial contraction.

There is a form of inflammation of this region known as tubercular, or scrofulous pharyngitis, which frequently accompanies tubercular processes in other parts, but it is not exclusively connected with the tubercular condition, occurring also in syphilis and even in persons otherwise healthy. It is characterised

by inflammation of the follicles, which become dry and caseous, then break up and ulcerate, giving rise sometimes to extensive destruction of tissue. This is more frequent in the lower pharynx than in the naso-pharynx.

In advanced tuberculosis, ulcerations in the naso-pharynx are not uncommon, but they do not run to much size. In some cases the actual existence of miliary tubercle in the ulcers, and in the immediate neighbourhood, has been demonstrated.

The treatment of tubercular disease of this region resolves itself (of course in addition to the treatment of the constitutional condition) into attempts to alleviate distressing symptoms. One of these is usually pain, and this may be relieved by soothing and narcotic applications and inhalations. Among the latter those of benzoin, aldehyde, chloroform, and lupulin, may be of service, and for topical application solutions containing morphia, with or without chloride of zinc. Carbolic acid and glycerine (1 in 150) has also sometimes caused temporary amelioration. Strong caustics are not to be recommended, nor am I in favour of the use of insufflations of powder in the naso-pharyngeal region. When the condition is merely one of catarrh, accompanying tubercle elsewhere, the measures advised for catarrh will be applicable.

Syphilis in the Naso-Pharynx.

Knowing how frequently the throat suffers in syphilis, we may expect that the naso-pharynx will frequently be affected by extension. In many cases of syphilis there is some catarrh of the naso-pharynx, and this may go on to destructive inflammation, ulceration, and cicatricial contraction, and adhesion. The rhinal mirror will often reveal ulceration in various parts of

the region, on the vault of the pharynx, on the anterior, posterior, and inferior walls, and on the pharyngeal tonsil. It seems, however, clear that the nasopharynx does not suffer in syphilis nearly so frequently as the lower pharyngeal region and the palate, though Wendt says, that "in three-eighths of the cases in which decided syphilitic diseases existed in other mucous membranes, in the skin, or in the bones, or where the evidences of such diseases were visible, the nasopharyngeal space was also implicated in one way or another." The openings of the tubes frequently suffer constriction either from cicatricial contraction or condylomatous vegetations, and Gruber has described one case in which one Eustachian tube was completely occluded by cicatrices after syphilitic ulceration.

The symptoms of syphilitic ravages in this region are often vague, but there may be pain, sometimes severe, and shooting towards the ears, headache, deafness, tinnitus, and foster of the air expired through the nostrils, especially when the disease has extended to the bones.

The history of the case, the appearances seen on examination with speculum and mirror, the condition of the neighbouring glands, &c., must be called in to aid in the diagnosis.

Treatment must be mainly constitutional, and suited to the stage of the disease. The parts must also be kept thoroughly cleansed, and nasal douches of chlorate of potash, permanganate of potash, and carbolic acid are valuable for this purpose.

Inhalations may be employed as recommended in catarrh when the state is a catarrhal one, and local applications by means of a suitably curved brush or sponge may be applied by the aid of the rhinal mirror to the diseased and ulcerated parts. Sulphate of copper (15 grains to 1 oz.) is probably the best application to

syphilitic ulcerations, or solid nitrate of silver may be applied.

Morbid growths of the Naso-Pharynx.

In addition to the adenoid vegetations already described as frequently occurring as a result of chronic catarrh of this region, there are found various forms of *naso-pharyngeal polypi*, mucous, fibrous, sarcomatous, enchondromatous, or carcinomatous.

The symptoms caused by the presence of tumours in this region principally affect the speech and respiration. If they be so large and so situate as to depress the velum, deglutition will also be interfered with.

Examination by speculum, rhinoscope, and the finger passed behind the palate, will reveal the presence, situation, and size of the tumour.

Treatment consists merely in removal by forceps, ligature, *écraseur*, or galvano-cautery. Into the details of the various operations required for the purpose I cannot here enter, but must refer to more elaborate works on general and special surgery, such as my friend Mr. Spencer Watson's valuable work on diseases of the Nose.

Foreign Bodies in the Naso-Pharynx.

The incursion of foreign bodies into the post-nasal space is not common. Children not unfrequently force marbles, beads, &c., into the nostrils, and in endeavouring to extract them they may be pushed back into the naso-pharynx; in this case, however, they would probably fall down into the pharynx, and be either swallowed or expelled by coughing and retching.

In vomiting, some portion of the contents of the stomach may be forced above the soft palate into the naso-pharynx. Cases have been recorded, some quite recently,

in which ascarides and other intestinal parasites have been found in the Eustachian tubes and middle ear. These have probably been forced in the act of vomiting into the post-nasal space and have thence crept into the orifice of the Eustachian tube.

The presence of foreign bodies in this region will be ascertained by use of the speculum and rhinal mirror, aided by digital examination, and the offender may in some cases be easily removed by the finger inserted behind the soft palate. Each case, however, will probably exercise the ingenuity of the surgeon in devising means for its removal.

CHAPTER V.

DISEASES OF THE PHARYNX, THE TONSILS, AND THE UVULA.

In describing the principal symptoms, causes, and treatment of diseases of the pharynx, I shall consider them in a somewhat similar order to that followed in the preceding chapter with regard to the affections of the naso-pharynx, with which, indeed, they are frequently connected by precedence, sequence, or continuity, and shall then proceed to the diseases especially affecting the tonsils and the uvula.

Catarrh of the Pharynx. Pharyngitis.

Pharyngeal catarrh may be acute or chronic, and the latter usually assumes the characters of the form known as granular or follicular sore throat. An intermediate degree of catarrhal inflammation is sometimes described as sub-acute, but it is scarcely necessary to consider it as a distinct form of affection, it being only a milder degree of the acute pharyngitis.

Acute catarrh of the pharynx.—An acute pharyngeal catarrh generally occurs in connection with a like affection in the naso-pharynx, larynx and oral cavity. The symptoms, indeed, are often more evident and well marked on the soft palate than on the walls of the pharynx themselves.

The symptoms of an acute pharyngitis are—some difficulty of swallowing, with a sensation of dryness and discomfort in the throat, hoarseness, and cough. There is usually some little fever, and the patient has

the symptoms generally recognised as accompanying "a cold." The attack, as a rule, passes off in a few days, but frequent attacks, if neglected, are liable to set up a permanent tendency to catarrh, a relaxed condition of the pharyngeal mucous membrane, and to end in a chronic pharyngitis. In persons also of a weakly constitution the affection is likely to be more obstinate.

The predisposing causes of acute pharyngitis are weakness of constitution, continual exposure to unhealthy atmospheric influences, and anything which tends to set up or keep up a feeble state of the system. Over-exertion of the voice, excess in smoking, &c., may also render the pharynx liable to catarrhal attacks. The immediate exciting cause will probably be exposure to sudden changes of temperature, or damp, &c.

Examination of the pharynx of a patient with acute catarrh shows the whole mucous membrane reddened, congested, and shining. The veins appear more visible than usual, and are sometimes somewhat varicose.* If the catarrhal inflammation is very acute, the mucous membrane may appear considerably swollen. As I said just now, the soft palate is especially affected, and the uvula shares in the condition.

With regard to treatment, often but little in the way of special medication is required. Avoidance of exciting causes and staying in doors for a day or two, mild diaphoresis, regulation of the digestive organs, which are frequently disturbed, with easily assimilable diet, will usually effect a cure. If the stiffness and pain in the throat are severe, there is nothing better than a wet compress (see p. 38). In the quite early stage small doses of opium are very effectual in cutting short a catarrh. Inhalations of simple unmedicated steam

* See a Paper on Varix of the Mouth, Pharynx, and Larynx, by Llewelyn Thomas, M.D., *The Specialist*, February, 1881.

are very grateful, and gargles of chlorate of potash, or the use of Wyeth's tablets of chlorate of potash, will assist in hastening the cure.

Frequent attacks of acute catarrh, especially if neglected, are apt to give rise to a permanently relaxed condition of the mucous membrane of the pharynx and fauces. This condition causes the patient to feel a constant discomfort in the throat, especially in the morning, with a feeling as if there was always something in the throat requiring to be got rid of. The uvula, in these cases, is generally relaxed and elongated. On examination, the membranes are seen to be in a relaxed and flabby condition.

Treatment must be local and general. The digestive organs, the liver especially, frequently demand attention, and the general health will often require looking to. Locally, gargles of chlorate of potash are usually very useful, and with them must be combined the use of astringent lozenges. Astringent solutions may also be applied locally—one consisting of equal parts of tincture of krameria and glycerine of borax has proved, in my hands, very efficacious; it was recommended to me by my friend, Dr. Roberts Thomson, of Bournemouth. Should the uvula be very long and relaxed, it must be amputated.

Chronic pharyngitis. Granular or follicular pharyngitis.—This form of catarrh of the pharynx may occur either distinctly or as a result of acute catarrhal inflammation. It may be simultaneous with a like condition of the larynx or naso-pharynx, or it may exist alone. The symptoms which characterise follicular pharyngitis are more disagreeable than severe. They consist in the constant desire to remove a foreign body from the throat, and a stiffness and dryness of the parts. There is usually a troublesome, continuous, tickling, hacking cough, with hoarseness and an un-

certainty in the voice, which also soon becomes fatigued. When the disease extends to the nasal passages, breathing by the nose will be obstructed, and the sufferer will breathe continually with open mouth. In many cases, however, the symptoms, even of a considerable amount of disease, will be but slight.

On examination, the pharyngeal wall will be seen to be hyperæmic and slightly thickened; the veins varicose and tortuous. Small elevations are seen on the mucous membrane; these increase in number as the disease advances, and may coalesce so as to form flat prominences. These consist of the swollen follicles and dilated and hypertrophied mucous glands.

The secretion is usually diminished, but in some cases the surface may appear clogged with viscid exudation.

The posterior wall of the pharynx is the part most usually attacked, but the disease may extend to any part in which follicles are found. There is a form of the disease which usually commences in the vicinity of the tonsils, extending thence to the posterior wall of the pharynx, &c. This is characterised by an increased exudation of secretion from the follicles, of a cheesy consistence. There is not in this case any hypertrophy of the tissues, the tendency being rather to their wasting and atrophy.

Pharyngitis sicca, or dry pharyngitis, which was mentioned in the last chapter as also affecting the nasopharynx, is also a form of chronic pharyngeal catarrh. By some authors it is considered as a result of the atrophic form of chronic pharyngitis, and by others as a distinct affection. The mucous membrane in these cases becomes thin, pale, and dry. The veins may remain varicose and tortuous.

The symptoms are a great feeling of dryness in the throat, with occasionally pain and difficulty of swallow-

ing. Examination shows the posterior pharyngeal wall dry, glazed, and tense, and looking as though varnished.

The causes of chronic pharyngitis may be laid down in a series of three :—"1. Constitutional predisposition (this includes any cachexia, but especially the strumous diathesis). 2. Over-exertion of the voice (with consequent weakening of the mucous membrane of the throat). 3. Exposure to cold, the latter being the most immediate though not the most potent of all the causes" (Mackenzie). The persons most liable to follicular pharyngitis are those who, while compelled to use the voice much, are also frequently exposed to atmospheric changes, such as public singers, actors, costermongers, auctioneers, clergymen, &c. The frequency with which this affection is seen in the last-named class of persons has caused it to receive the familiar name of "clergyman's sore throat."

Treatment must consist, in the first place, in avoidance of the exciting causes; and, as the system of those affected is usually debilitated, tonic treatment is generally indicated. Locally, we must have recourse to gargles, inhalations, &c.

As astringent gargles, those of alum, tannin, &c., are useful, and inhalations of benzoin, benzole, and creosote. In the topical treatment of the granular condition various forms of caustic have been recommended, to be applied to the granulations, and also to destroy the varicose veins. For the latter purpose may be employed the acid nitrate of mercury, which is recommended by Dr. Llewelyn Thomas,* as very effectual, and causing little pain. Other authors have advised the use of heated wires, the galvano-cautery, nitrate of silver. For applying to the granulations themselves, the London paste, which consists of caustic soda, and

* Loc. cit.

unslaked lime, in equal parts, made into paste with water, is especially recommended by Dr. Morell Mackenzie. It is applied to each granulation separately, only two or three being touched at each sitting; and immediately after the application, the patient should gargle and rinse the throat with cold water. Strong solutions of nitrate of silver, pure tincture of iodine, and strong solutions of chromic acid are also recommended for painting the hypertrophied follicles.

In dry catarrh, we can do little beyond alleviating symptoms. The general condition of the patient's health must, of course, be thoroughly inquired into and carefully treated. Vapour inhalations of simple steam, or medicated with benzoin, creosote, or aldehyde, are valuable, and lozenges, especially the effervescing lozenges of chlorate of potash, are agreeable in increasing the flow of saliva, and thus moistening the mouth. Occasionally the application to the mucous membrane of irritants, such as nitrate of silver or tincture of iodine, will alleviate the symptoms.

As prophylactic measures, may be mentioned regulation of the digestive organs, avoidance of undue exposure to noxious atmospheric influences, and regulating and diminishing the use of the voice. Stimulants and tobacco should be given up. If the patient is very liable to catch cold, a winter or two in a warm, equable, dry climate, such as Torquay or Bournemouth, in this country, or the South of France, Italy, or Egypt, may be necessary to break up the predisposition.

Diathetic Pharyngitis.

I give this name to those inflammations of the pharyngeal region which are apparently connected with some constitutional diathesis, such as struma, tubercle, syphilis, rheumatism, and gout. Tubercle and syphilis,

as manifested in the pharynx, will be considered in distinct sections.

When the constitution is strumous, a relaxed and inflamed condition of the throat is common, and is often little amenable to treatment. The inflammation is of a low, sluggish, unhealthy form, with little effort at any healing or curative process. Ulceration may sometimes occur in these cases, and when it does so, it takes long to heal. Strumous sore-throat, however, as a rule, exists as a long-standing catarrhal inflammation connected with a strumous condition of the constitution. In these cases, of course, our treatment must be mainly directed to the constitutional state, and good food, cod-liver oil, tonics, fresh air, exercise, and regulation of the bodily functions will be required. Locally, remedies calculated to brace up the relaxed mucous membranes may be employed with advantage in the form of lozenges, gargles, or pigments.

It is not uncommon for persons subject to these repeated strumous catarrhs to become phthisical, and then possibly the characteristic features of tubercle in the pharynx may be developed. Syphilis also may often be grafted upon scrofula, and it is probable that in a majority of the instances in which ulceration takes place, there is an element of either tubercle or syphilis in the case.

The frequency with which the arthritic diathesis manifests itself in the throat has, of late years, been more widely recognised. The fact is beginning to be established that an intimate connection exists between acute rheumatism and some forms of throat affection, tonsillitis especially. On this point I shall speak again when treating of tonsillitis; but now I shall refer only to other forms of sore-throat found in rheumatic subjects. With regard to the symptoms, I follow the example of Mackenzie, and quote the description of

Trousseau. "An individual subject to rheumatic pains takes cold. At the end of a few hours he experiences an extremely acute pain in the throat, so that he can scarcely swallow a drop of water, or even his saliva, the deglutition of these small quantities of liquid causing much more suffering than that of an alimentary bolus. On examining the throat, the interior of the pharynx and the velum palati present a redness, more or less pronounced. The uvula invaded by the inflammation is œdematous and elongated. All these phenomena are going to disappear with great rapidity, because they are fugacious, like most affections of a rheumatic nature. The next day, the acute pain of this angina will have ceased, as if by enchantment, at the same time that another pain will occupy the neck, producing torticollis; whilst the day after, one of the shoulders may be the part attacked. Again, another day, and the patient will complain of lumbago. As to the angina, its duration may vary from twenty-four to forty-eight hours. It is because they have had to deal with these rheumatic sore-throats that the physicians to whom I have referred have been enabled to boast of having gained the power of averting incipient inflammations of the throat. Patients who have had several attacks of sore-throat of this kind are able, at the outset, to distinguish the rheumatic affection from a veritable phlegmonous inflammation; but the physician cannot differentiate the two maladies in the first moments of their appearance." In making a diagnosis, therefore, we must be assisted by enquiries as to whether the patient is a rheumatic subject or comes of a rheumatic family.

Treatment must of course be mainly directed against the diathesis. Guaiacum, iodide of potassium, alkalies, the salicylates, all these are useful in certain cases, and where one fails recourse may be had to another.

Locally, either hot fomentations and inhalations and sedative gargles may be employed, or on the other hand cold compresses and ice to suck.

There is also a form of sore-throat connected with gout, and Mackenzie mentions a case where an acute pharyngitis suddenly disappeared and an acute gout developed in the right big toe; after three days this in its turn vanished and acute hyperæmia of the pharynx reappeared.

The treatment must be constitutional, with special reference to the diathesis.

Ulcerative and Gangrenous Pharyngitis.

In this section I include only simple ulceration of the pharynx not connected with tubercle, syphilis, scrofula, or cancer. An ordinary pharyngeal inflammation rarely, if ever, goes on to the extent of ulceration, but if the system be debilitated, as by close study combined with impure air, the inflammation may assume such a form. The form of angina, known as "Hospital Sore-throat," is the type of this kind of affection. Hard work, with deficient exercise and constant breathing of the necessarily more or less contaminated atmosphere of hospital wards induces a feeble state of health and a generally cachectic condition which finds expression in an ulcerative affection of the throat.

The symptoms are similar to those of other forms of pharyngeal inflammation; heat, dryness, and soreness in the throat, with considerable difficulty and pain in swallowing. The tongue becomes foul and the breath is offensive. Superadded to the local symptoms is a general condition of "out-of-sorts"-ness, with slight feverishness, headache, and want of appetite. Examination shows swelling and inflammation principally

upon the fauces and tonsils, with a congested condition of the mucous membranes of the throat generally. The ulcers are not deep, but may sometimes be of considerable size.

The cause of the affection, as I have said, is a generally debilitated condition of the system with septicæmia from contaminated atmospheric influences.

As a rule the affection, if promptly treated, does not last very long and ends in recovery. As to treatment, the patient should be removed to a salubrious atmosphere, and a generally tonic and strengthening regimen adopted. The digestive organs should be first acted upon and the treatment may advantageously commence with an aperient. Ammonia, quinine, and iron fulfil the indications for tonics, and locally gargles of permanganate, or chlorate of potash, with astringent lozenges and sedative inhalations are most useful.

Although this form of ulceration is not usually serious, a greater degree of blood poisoning may set up a form of sore-throat, in which there is destructive gangrene of the mucous membrane of the pharynx.

The symptoms are those of rapidly increasing sore-throat, with great constitutional disturbance, extreme weakness, prostration, and collapse. The breath becomes extremely offensive and has a characteristic gangrenous odour. Examination shows dark gangrenous patches on all parts of the pharyngeal cavity, the back of the pharynx, pillars of the fauces, and tonsils. On removal of the sloughs, there ensues deep ulceration.

The affection is a very serious one on account of the gravely contaminated state of the blood, which gives rise to it, and is often rapidly fatal. Such being the case, treatment must be principally general and must consist in efforts to maintain the system until the blood has got into a more healthy state. The most nutritious food, eggs, beef tea, &c., given at frequent intervals

with ammonia, quinine, bark, or perchloride of iron, as medicines, will be necessary. Locally, endeavours must be made to alleviate pain and distressing symptoms by inhalations of an antiseptic and sedative character.

Retropharyngeal Abscess.

This consists in the formation of an abscess in the posterior wall of the pharynx.

The symptoms are often at first obscure and the affection advances slowly. It is only when the swelling has assumed considerable size and interferes with the swallowing that the patient comes under notice. This dysphagia, and if the abscess be low down, dyspnoea are the principal symptoms, but there is also some pain, alteration of voice, and cough, with more or less constitutional disturbance.

Examination generally easily reveals the presence of a bright red swelling at the back of the throat, and fluctuation may be perceived by the finger.

The causes of post-pharyngeal abscess are various. In many cases it appears to originate idiopathically, in some it is due to disease of the cervical vertebræ, or it may arise as a sequel of an acute specific fever, or in pyæmia. Children are much more liable to it than adults, and the symptoms are sometimes very like those of croup.

As regards treatment, if the case be diagnosed before pus is formed, cold should be applied and ice given to suck. Usually, however, the patient will not come under notice until the presence of matter is evident. This must be let out by incision, and the system must be supported. Inasmuch as the children who suffer from this affection are frequently delicate and strumous, a course of cod-liver oil, iodide of iron, &c., will be of value in removing the predisposition, and this may

advantageously be combined with change of air and other strengthening measures.

Tubercle in the Pharynx.

It is only within the last few years that the evidences of tuberculosis in the pharynx have received much attention, and the differential diagnosis of pharyngeal phthisis, as it is called, has been clearly laid down. This is the more remarkable when it is remembered how accessible the pharyngeal region, especially those parts of it usually affected by tubercle, is to view, and how easily, therefore, the various stages of tuberculisation in this region may be watched.

The pathological process which occurs may be divided into two stages. (1) That of the deposit of tubercular matter in the throat. (2) That of its softening and ulceration.

In the first stage there are found on different points of the velum palati, fauces and posterior wall of the pharynx, small papillary prominences, varying in size from that of a millet-seed to that of a hemp-seed, of a white or bluish-grey colour, sometimes slightly yellowish. These are firmly implanted in the subepithelial and connective layers of the mucous membrane. In many cases the surrounding mucous membrane is but little inflamed, but in very acute cases there may be considerable inflammation, with swelling of the tonsils and of the follicles at the base of the tongue.

In the chronic form the mucous membrane is roughened, thickened, and of a reddish or livid hue.

After a time, softening and destruction of these granular projections takes place, leaving behind rounded cup-shaped ulcerations of size varying from a hemp-seed to a lentil, with sharply cut edges and a greyish base covered with a thin adherent exudation. In

some cases the edges are irregular and eroded and undermined. In time these ulcers extend and run together, sometimes covering a considerable extent of the velum and pharyngeal walls. The uvula is often much enlarged, the pillars of the fauces swollen, the tonsils ulcerated, and the base of the tongue swollen. Around the ulcerations, fresh crops of nodules spring up, which in their turn break down and ulcerate.

The first symptom of tubercular disease of the pharynx is pain in the throat, varying from a simple discomfort to a pricking, burning sensation, which is much increased in deglutition; the throat also feels dry and there is a constant desire to swallow.

These symptoms may occur while the patient is to all appearances in good health and with no signs of tubercular mischief elsewhere. Careful enquiry, however, may elicit the fact that the patient has had hæmoptysis, has been subject to "bronchitis," or has been losing flesh. In other cases the throat symptoms will be preceded by phthisical manifestations in the lungs or larynx or both.

Examination at this period shows the small grey nodules, already described, scattered in greater or less number about the soft palate, fauces and pharynx.

It is, however, rarely that patients come under notice at this early stage; thinking they have a simple sore-throat, it is not until the affection has reached the stage of ulceration that they seek advice.

When ulceration occurs the symptoms are aggravated. Pain and dysphagia increase, the former becomes lancinating and burning, and prevents sleep. The difficulty and pain in swallowing become extreme. Isambert * says that in this affection "the dysphagia

* Conférences cliniques sur les maladies du larynx, &c., p. 229.

reaches a degree which we have never seen attained in any other disease, even in cases of cancer and laryngeal phthisis with ulceration and œdema of the epiglottis and arytenoids." There is, besides, some paresis of the velum, and also frequently profuse salivation, to add to the miseries of the patient. The pain shoots towards the ears and may be accompanied by deafness.

Examination now shows the appearances due to the ulcerations above described.

In the lungs or some other organs of the body, corresponding evidences of tubercle will probably be detected; the larynx frequently escapes, but it may become involved; while on the other hand, in some cases the pharynx is secondarily affected with tubercle after its deposit in the larynx.

The causes of pharyngeal phthisis are those of tubercular phthisis generally, and why in some cases the tubercle shows a predilection for this region is as yet unexplained.

The affection with which tuberculosis of the pharynx is most likely to be confounded is syphilis, but the characteristic appearance of the lenticular ulcers, the history of the case, the fact that the pain in the pharynx was the first thing to attract the attention of the patient, and the non-efficacy of antisypilitic remedies will assist in making certain the diagnosis.

With regard to treatment, unfortunately little can be done. The disease runs a rapid course, the usual duration of life after the manifestation of tubercle in the pharynx being from two to six months, and all we can do is to palliate symptoms. Of course the general treatment of phthisis must be followed, and locally, pain may be relieved by applications of morphia, either in glycerine and water, or in the form of insufflation. Caustics are of no use.

[Since writing this section I have received the

Archives of Laryngology, for January, 1881, in which is a valuable paper on "Cases of Tuberculosis implicating the Mouth and Throat," by Mr. Lennox Browne and Dr. Dundas Grant, which I would recommend for perusal to all interested in the subject. With regard to local treatment these authors have found the most generally useful application one of chloride of zinc, morphia, glycerine, and water. Insufflation of powdered starch with morphia is not recommended. In one case an application of a mixture of compound tincture of benzoin, paregoric, tincture of belladonna, yolk of egg and water gave great relief.]

Syphilis in the Pharynx.

As stated in the chapter on Pathology (p. 27), the pharynx suffers in a very large proportion of cases of syphilis. The primary affection very rarely occurs in this region, but the secondary or tertiary symptoms are common. Quite early in syphilis, a catarrhal condition of the pharyngeal mucous membrane is found which, in the secondary stage, assumes the form of an erythema, a uniform redness of the velum, fauces and tonsils, circumscribed by a definite boundary line, and arranged symmetrically. With this are combined the subjective symptoms of an ordinary sore-throat, dryness, pain in swallowing, sometimes hoarseness, &c. The other form of secondary manifestation in the pharynx is that of mucous tubercles (*plaques muqueuses*). These are bright red patches, with an opaline appearance like what artists term "glazing" (Isambert), and they are found principally on the fauces and soft palate. The subjective symptoms are increased, and pain and difficulty of swallowing more manifest. Concurrently may be found secondary manifestations on the skin.

In the later stages of syphilis, ulcerations are developed in the pharynx, which may be either superficial or deep. The superficial ulcers, which occur usually on the soft palate, but sometimes on the pillars of the fauces and the tonsils, show a great tendency to spread in extent, but not in depth; they are irregular in form, with ragged edges, and are often covered with an unhealthy discharge.

The deeper form of ulceration is the result of the softening of gummata. These are situated on the hard palate, the velum, or the back of the pharynx. With regard to their relative frequency in different situations, authorities seem divided in opinion. Mackenzie* says gummy tumours in the pharynx "are generally situated under the mucous membrane of the posterior wall, but are sometimes seen in the soft palate." Isambert† says "the ulcerations are sometimes developed on the posterior wall of the pharynx; but this lesion is rare—indeed, very rare—the posterior wall being habitually the chosen seat of scrofula."

When the ulceration attacks the soft palate, it causes a perforation, and thus opens up a fistulous communication between the mouth and the naso-pharynx, which interferes with the voice, and causes liquids to pass up into the nose when the patient endeavours to swallow them. If the ulcerating gumma be situated on the palatine vault, serious consequences often result from necrosis of the palatine or superior maxillary bones, and perhaps of the bones of the nose. The further course of the disease is to repair with considerable cicatricial contraction. It is not uncommon for the soft palate to be united by adhesion to the posterior wall of the pharynx, closing more or less completely the communication between the pharyngeal and naso-

* Loc. cit., p. 90.

† Loc. cit., p. 158.

pharyngeal cavities. If this closure is complete, "nasal respiration is wholly abolished; smell and taste are impaired; the mouth and lower pharynx are dry; and the nasal secretions cannot be removed in the usual manner" (Wendt).

In many cases the ordinary course of the disease is modified, its progress made more slow, and its intractability to treatment increased, by the co-existence of scrofula or tuberculosis. In these cases also the diagnosis is made much more difficult.

The objective symptoms will be evident from the above description of the lesions produced, and the subjective symptoms have been already mentioned. They are often very slight, excepting when perforation of the palate causes regurgitation of fluids by the nose and difficulty in swallowing. Pain is not usually severe, but may be so, and may shoot towards the ears.

In the treatment of syphilis in the pharynx, we must adopt both local and constitutional measures. Internally, in the secondary stage, we may give mercury, either in the form of the cyanide ($\frac{1}{10}$ gr. twice a day), the hydrargyrum cum creta (one grain two or three times a day), or the subchloride (Pil. Hyd. subchlor. Co., gr. 5, once or twice daily). Locally, to the mucous patches, and the ulcers resulting from them, probably the best application is the solid nitrate of silver, or tincture of iodine may be applied. Emollient and astringent gargles should be employed, such as chlorate of potash or tannin.

In tertiary manifestations, we must give iodide of potassium internally, or iodide of sodium may be substituted for it. The dose may be increased gradually from 5 grains to 10, or even more, three times a day.

Locally, the ulcerations should be touched with sulphate of copper (15 grs. to 1 oz.), solid nitrate of silver, or acid nitrate of mercury (1 to 40). The gal-

cautery may also be used to these ulcerations, and usually succeeds better than other forms of caustic. Antiseptic gargles and mouth washes, such as those of boric acid, chlorate of potash, or permanganate of potash, should be frequently used.

The administration of the iodide of potassium should be continued for some little time after all symptoms have disappeared, and change, sea air, &c., will aid in bringing the patient to health.

Tumours of the Pharynx.

Tumours occurring in the pharynx may be either benign or malignant. The non-malignant growths of the pharynx may be papillomatous, fatty, fibroid, sarcomatous. The fatty and fibrous tumours sometimes attain considerable size. The symptoms produced depend upon the size and situation of the growths and the consequent extent with which they interfere with deglutition or swallowing. Examination by the reflected larynx and a good light will, in most cases, easily reveal the presence and position of the tumour. The treatment of such bodies consists, of course, in their removal. This may be accomplished by avulsion with forceps, by the use of the *écraseur*, the galvano-cautery or ligature, or by frequent application of strong caustics.

Malignant tumours of the walls of the pharynx may be either scirrhus or epitheliomatous. The former is a variety usually found in the upper part of the pharynx, while in the lower, epithelioma is more common. In the latter situation, cancer is much more common than in the former, and it usually extends from the pharynx to the larynx.

The symptoms of cancer in this part are hoarseness of voice, difficulty of deglutition, expectoration, great pain, and extension towards the ear, and more or less marked

general cancerous cachexia. Examination will reveal the presence of the tumour and its consistence may be felt by the finger. After a time, ulceration takes place, and the neighbouring glands become affected.

With regard to treatment we can do no more than endeavour to relieve symptoms. Where there is any doubt as to the diagnosis it is well to try the iodide of potassium on the chance of the affection being syphilitic. Operations for the removal of the disease, or of the whole larynx, are rarely justifiable, as the relief gained is only temporary. When swallowing becomes impossible the patient must be fed per rectum.

Foreign Bodies in the Pharynx.

It is not uncommon for foreign bodies to "stick in the throat." Lumps of meat, coins, needles, fishbones, &c., may all become lodged in this situation. The principal symptoms produced are pain, dysphagia, and cough. If the substance be sharp and pointed the pain will be correspondingly pricking and acute. If a foreign body remain long in the pharynx it will cause great irritation and inflammation, sometimes ulceration. When a patient complains of a foreign body in the throat, careful examination must be made for it with the reflector and mirror, and the whole pharyngeal cavity should be explored with the finger if the body be not seen. The presence and position of the offender having been ascertained, attempts should be made to remove it by means of the finger, forceps, or other suitable instrument. If the patient appear in imminent danger of asphyxia, tracheotomy should be at once performed before attempts are made to remove the foreign body. The sensation of the presence of something in the throat generally remains long after the thing itself has been removed, and patients not unfre-

quently apply for the removal of a foreign body which has been already expelled, without their knowledge. It is often exceedingly difficult in such cases to persuade them that there is nothing to remove. The symptoms may be relieved by applying astringents, sucking ice, &c.

Neuroses of the Pharynx.

The neurosal affections of the pharynx may affect either the sensory or motor nerves. The sensation of the pharynx may be lost, increased, or perverted, or there may be actual nerve pain.

Loss of sensation is not common, but is found generally in post-diphtheritic paralysis. Treatment includes the administration of strychnia and the application of the electric current.

Increase of sensation is much more common, as all laryngoscopists know to their annoyance. In hysteria it often assumes aggravated proportions. The best treatment is probably the sucking of ice, which is generally successful in a greater or less degree.

Perversion of sensation, generally assuming the form of a feeling of something in the throat, is not uncommon in hysteria, and the general treatment of that affection is required, modified according to the local necessities of the case.

Neuralgia, or actual pain in the nerves of the pharynx is not common. Mackenzie * says he has met with many examples of it, principally in young girls, generally combined with anæmia and sometimes chlorosis. Not usually any hysteria. The most efficacious treatment he found to be the application of tincture of aconite.

The neuroses affecting the nerves of motion of this region assume four principal forms: they are either (1)

* Op. cit., p. 114.

the paralysis of the constrictors of the pharynx; (2) loss of power due to progressive bulbar paralysis; (3) paralysis following diphtheritic and other forms of sore-throat; (4) loss of power of motion of the palate associated with facial paralysis.

Paralysis of the constrictors is always combined with a similar affection of the œsophagus, and occurs in general paralysis of the insane; in progressive muscular atrophy; occasionally in diphtheritic paralysis; in glosso-labio laryngeal paralysis; and in hysteria. The prominent symptom is dysphagia, the food having a tendency to get into the larynx, especially if fluid, and the patient will have to be fed by stomach pump, the œsophageal tube or enemata.

In progressive bulbar paralysis is produced that phenomenon known as glosso-labio-laryngeal, or palato-glosso-pharyngeal paralysis. The symptoms are impairment of speech and articulation, difficulty of swallowing, dribbling of the saliva from the mouth, and if the disease extend to the larynx, voice and respiration are affected. The patient has to be fed through a tube or per rectum.

Diphtheritic paralysis. This will be again touched upon in the chapter on Diphtheria. The only form to be mentioned here is that of the soft palate, which may also occur after other forms of sore-throat than diphtheritic.* The soft palate loses much of its power of voluntary motion, and this is accompanied by some loss of sensibility also. It is usually more evident on one side than the other. There is some difficulty of swallowing, and of expectoration, and the voice becomes nasal in tone. Treatment consists in the administra-

* See a clinical lecture on "Diphtheritic Paralysis," by Professor Hardy, of Paris; translated by the author in *Medical Press and Circular*, June, 1879.

ion of tonics, especially strychnia, and the application of the induced current. The result is generally that of cure. In some cases of facial paralysis, the soft palate is affected, but these cases are rare and do not require any detailed notice in a small work like this.

Affections of the Tonsils.

Acute Inflammation. — Tonsillitis. — Quinsy. The first symptoms in cases of acute tonsillitis are those of general febrile disturbance. There is a sense of malaise, the digestive organs are probably upset, there may be rigors, the pulse is quickened, and the temperature rises. These symptoms, of course, vary in intensity according to the severity of the case. Then there is a feeling of soreness and dryness in the throat, pain and tenderness over the tonsils and a constant desire to swallow, the attempt to do which causes pain, frequently shooting towards the ears. There is considerable secretion of saliva and a good deal of viscid mucus collects about the throat. The voice becomes nasal and thick, and the breathing may be obstructed if the swelling is very great. The tongue is coated, and there is often considerable headache, thirst and constipation.

Examination, which is often difficult owing to the inability of the patient to open the mouth, reveals a red and swollen condition of one or both tonsils. This may be so great that the tonsils meet in the middle line; the inflammation also extends more or less to the fauces, uvula and palate. The follicular secretion may collect in patches upon the glands, sometimes looking almost like diphtheritic membrane, but it will be found to be easily removable, not being really membranous. After a few days the inflammation either subsides and ends in resolution, or goes on

to suppuration. In the latter case the formation of pus is marked by increase of pain which is throbbing and shooting, there are rigors, and palpation of the tonsil may reveal fluctuation.

Deafness and noises in the ears are not uncommon from extension of the inflammation along the Eustachian tube, and occasionally an actual inflammation of the middle ear is set up in this way.

The abscess in the tonsil may burst spontaneously with instant and marked relief to the patient. In many cases, however, it requires to be opened. After the acute inflammation has subsided there may remain a chronically inflamed and enlarged condition of the tonsils, which will be referred to at greater length presently.

The predisposing causes of quinsy are (1) age, the disease being most common between 15 and 35, and being rare after middle life, (2) previous enlargement of the tonsils, (3) strumous constitution, (4) the rheumatic diathesis. The last seems to bear a marked etiological connection with tonsillar inflammation. This fact was very forcibly insisted on by Lennox Browne,* and has since been noted by other observers as Dr. J. K. Fowler, who gave a series of cases illustrating the point in the *Lancet*, Dec. 11, 1880. I have myself frequently noticed the connection, and quite recently had a case where a sharp attack of tonsillitis was followed very shortly by a severe bout of rheumatism.

The exciting cause is generally exposure to wet and cold.

Treatment should commence with purgation, constipation, as I have said, being usually present. The purgative may advantageously be combined with a chalybeate tonic and with salicylate of soda. If the

* Op. cit.

case is seen early, guaiacum in the form of lozenges will often cut it short, or aconite will be found very valuable in small doses frequently repeated. The diet must be fluid or semi-fluid, bland and nourishing. Mouth-washes of chlorate of potash or permanganate of potash are agreeable, but if the swelling be great, gargling will be impossible. Warm milk and water may also be held in the mouth. Steam inhalations will sometimes hasten suppuration, if that be inevitable, and warm poultices and fomentation to the outside of the throat will assist to the same end, at the same time soothing the pain. When the presence of pus is unmistakably evident, it should be let out by incision with a bistoury, the knife being carried upwards and towards the median line. When the pus has escaped and the inflammation subsided, astringent gargles may be given and tonics and good food administered. Change of air will expedite the cure.

Chronic enlargement of the tonsils may, as I have said, remain as a result of an acute inflammation, or may occur, as is perhaps more frequently the case, independently. It is not uncommon as a congenital affection or as occurring in very early life.

The symptoms caused by enlarged tonsils are: thickness of speech, mouth-breathing, snoring in sleep, difficulty in swallowing, deafness. The last-named symptom seems to be due not to actual pressure of the enlarged glands upon the orifices of the Eustachian tubes, but to a thickened condition of the mucous membrane around them.* When the enlargement is very great the difficulty of breathing may be extreme, and in the case of young children may lead to deformity of the chest, and serious interference with the function of the

* See paper by the Author, "Cases of Deafness with Remarks." *The Specialist*, Oct. 1880.

lungs. The difficulty of swallowing also prevents the child taking a proper amount of solid food, and thus interferes with nutrition.

Examination reveals the state of affairs; the tonsils are seen projecting more or less towards the median line, frequently meeting there. Both are usually affected, but one generally more than another, and to the larger of the two the uvula is frequently seen adhering by its tip.

With regard to treatment, inasmuch as the subjects of enlarged tonsils are usually weakly and strumous, good diet and tonic medicines, as cod-liver oil and iodide of iron, will be indicated. Locally, applications of astringents are of little or no use, and caustics are very painful and tedious. The best treatment for enlarged tonsils is undoubtedly removal by means of the guillotine figured on page 41. The operation is but slightly painful, is efficacious, generally easy of performance, not dangerous, and has no evil after-effects. The wound usually heals in a very short time, and the only precautions necessary for the patient are to avoid all chances of catching cold for a few days and not to take hard or irritating food. I have never seen any ill effects follow the operation, and the result has always been marked benefit to the patient.

When the Eustachian tubes are affected and there is deafness, tinnitus aurium, or inflammation of the middle ear, treatment must be directed to this region. Inhalation, by the Valsalvan method, of benzoin or creosote, and the frequent use of the Politzer air-bag will generally be found effectual. If middle-ear inflammation be present it must be treated on the principles laid down in works on Aural Surgery.*

* See also the Author's pamphlets on "Otorrhœa" and "Tinnitus Aurium," published by Baillière, Tindall, & Cox, London.

Foreign Bodies in the Tonsils are occasionally met with in the form of small calculi or concretions of the inspissated secretion of the gland. They do not cause any very well marked symptoms; sometimes a little sticking, or, if large, some difficulty of swallowing. They may generally be removed with forceps if they can be seen, or it may be necessary to excise the gland.

Cancer of the Tonsil is occasionally found, but it is very rare, as primarily affecting the glands. When it does occur it is usually encephaloid, but scirrhus is occasionally found. The disease commences as a tumour on the gland which assumes the characteristic cancerous ulceration. The symptoms are those of pain on swallowing, the pain darting towards the ears, thickness of voice, obstruction to breathing, and a thin offensive secretion constantly collecting in the mouth. With regard to treatment the growth may be removed, the galvano-cautery being very efficacious for this purpose. All measures, however, are merely palliative, the fatal issue being certain. Sedative applications may be applied to the part.

Affections of the Uvula.

The uvula partakes of the affections of the fauces and soft palate: sometimes, however, it is affected apparently by itself, the surrounding parts being but little involved.

Acute inflammation of the uvula, or *uvulitis*, gives to the part a swollen, red, and oedematous appearance. It is also much elongated and by hanging down against the tongue or even into the larynx it frequently excites a troublesome, hacking, irritable cough. This affection usually accompanies acute pharyngitis or tonsillitis. The treatment consists in scarification or amputation.

Chronic relaxation of the uvula is common in connection with ordinary chronic relaxed sore-throat. In these cases the symptoms are those of dryness and stiffness of the throat, and a feeling as if there were some foreign body to be got rid of, with a hacking tickling cough. Examination shows a generally flabby and relaxed condition of the velum and fauces with elongation of the uvula, which may hang down even into the larynx.

Treatment must consist in the application of astringents, the use of gargles or lozenges of a similar character, with general tonic medicines. If these means fail to effect a reduction in the length of the uvula, a portion of it must be cut off. Mackenzie gives a useful caution regarding this operation: "*In cases where there is any follicular disease of the throat, it is most important to cure that affection before the uvula is amputated*, as owing to the after-pain caused by the removal of the uvula, patients will not submit to any further treatment when they have recovered from the operation. Hence the patient remains uncured and the operation and he who performed it are brought into discredit."*

CHAPTER VI.

DISEASES OF THE LARYNX.

Laryngitis—Catarrh of the Larynx.

Acute Laryngitis.—The symptoms of acute catarrhal laryngitis vary much in intensity in different cases. There is generally at first a feeling of soreness in the throat, with some hoarseness, sometimes aphonia, usually not much pain or difficulty of breathing unless oedema occur. There is more or less of hard, laryngeal cough, and sometimes the larynx is tender to pressure. There are present also the usual constitutional symptoms of catarrh, and the tongue may be furred, the pulse quickened and the temperature slightly raised.

Laryngoscopically, the mucous membrane will be seen to be hyperæmic, and the cords congested. If the inflammation be severe there may be considerable swelling of different parts, especially of the ventricular bands and the membrane covering the arytenoid cartilages. Hæmorrhage sometimes occurs. On phonation the cords will be seen not to approach each other properly, either from swelling or from a want of power in the muscles moving them.

The course of acute catarrh of the larynx is generally to recovery, though it may result in oedema or pass on into a chronic affection. Repeated attacks of laryngitis may apparently originate morbid growth in the larynx.

The exciting causes of laryngitis are those of catarrhal inflammation in other parts, and synchronously with catarrh of the larynx there is usually a similar affection of the pharynx. Sedentary and indoor occupations, with perhaps occasional sudden exposure to cold, frequently induce this form of inflammation, which is, therefore, less common than might be supposed among

those constantly exposed to the rigours of the weather. Violent use of the voice may give rise to the affection, so also may the inhalation of irritating substances or impure air.

As to treatment, general measures such as are usually employed in catarrh may be used, and locally inhalation of vapours, medicated with some soothing remedy as benzoin, is indicated. The larynx should have as much rest as possible, the atmosphere of the room should be kept warm and the cough restrained by opium. A wet compress is often very efficacious. Opinions are divided as to the value of local applications to the larynx itself in acute catarrh, some authors recommending the use of strong solutions of nitrate of silver, while others do not advise the use of the brush until the acute stage is over and the affection is passing away. With the latter I agree, and rarely employ local applications in the acute stage.

An attack of acute laryngitis may leave the throat susceptible for some little time and the patient must, therefore, take precautions against cold. I do not advise much wrapping up of the throat externally as this, I believe, tends to increase the delicacy, but when the air is very cold or damp the use of a respirator is a great protection, preventing the direct access of the cold air to the delicate mucous membrane of the larynx.

Sea air, sea bathing, and the regular use of the bath, cold in summer, tepid in winter, will also help to make the system less susceptible to the effects of cold and changes of temperature. A winter in one of our southern health-resorts may also be advisable and will often make the patient quite strong again.

Edematous laryngitis — *Edema of the Glottis* — *Laryngitis phlegmonosa*. — In this form of inflammation of the larynx, the tissues are infiltrated with serous or

purulent fluid. The affection varies in severity and the symptoms also vary according to the particular part of the larynx most affected. The principal symptom, however, is usually great and increasing difficulty of breathing, which causes the patient to struggle for breath and make vigorous endeavours to clear away the obstruction which he feels in his throat. In some cases the affection may be so acute and rapid that the patient dies suffocated in a few minutes; in these cases, however, the oedema is usually traumatic in its origin, from the wounding of the larynx by some foreign body, or from scalds or burns.

In less acute cases, as the swelling increases, the voice becomes affected, but there is little cough or expectoration. Inspiration becomes stridulous and very laboured, and swallowing is difficult and painful.

Laryngoscopic examination reveals a red, engorged condition of the mucous membrane, with swelling of different parts of the larynx. The epiglottis is generally much swollen, and also the ary-epiglottic folds, and sometimes the ventricular bands. The vocal cords are not often much swollen.

If the symptoms are not relieved, evidences of insufficient æration of the blood and consequent carbonic acid poisoning are developed, giving rise to delirium and coma.

Oedema of the glottis is almost always secondary; it may follow an acute laryngitis, may be caused, as has been said, by some foreign body or by scalds or burns, may occur in purulent erysipelas, or may result from perichondritis of the laryngeal cartilages, giving rise to purulent infiltration. Simple inflammatory oedema may also supervene on "retropharyngitis, tonsillitis, pharyngeal diphtheria, angina ludovici and parotitis" (Von Ziemssen). The affection is often propagated from the pharynx, and this accounts for the frequency with

which the epiglottis is the part first and most affected. It may also occur after small-pox, typhoid fever, and in Bright's disease.

Treatment of such a severe and frequently acute affection must be vigorous and decisive, and the surgeon must retain his presence of mind and be prepared for any emergency. Local abstraction of blood by leeches often has good effect in lessening the swelling, and this may be followed by the application of moist warmth or of ice to the outside of the neck, and the constant swallowing of ice. Usually, however, it will be necessary to employ scarification. This should always, if possible, be performed, under the guidance of the mirror, by means of the laryngeal lancet. If this be not at hand, a long sharp-pointed bistoury or a gum lancet may be used. Inhalation of steam and the use of warm gargles will increase the effect produced by the scarification. If these means do not succeed, laryngotomy or tracheotomy must be performed, and the patient should not be allowed to get too low before the operation is undertaken. As the œdema is very rarely situated below the glottis, laryngotomy may usually be performed, and as it is easy of execution and efficient for the purpose of a temporary opening it will often be preferred to tracheotomy. The surgeon treating throat diseases should always be prepared to perform this operation, and he will find it a very good plan to carry about him one of Mackenzie's convenient pocket canulas, containing canula, pilot, and knife, a little companion which I always take with me when called to a patient suffering from throat trouble.

Chronic laryngitis.—The symptoms of this affection are hoarseness and alteration of the voice, irritable and obstinate cough, and hawking, with slight expectoration of viscid mucus sometimes slightly purulent or bloody. The voice soon becomes fatigued with use, but the

hoarseness is most marked when the vocal organ is put in action after an interval of rest. There may be some slight pain in the larynx, and there is generally a sensation of dryness, irritation, and tickling in the throat. Laryngoscopic examination shows more or less congestion, varying from a mere pinkish hue to a deep red, with some swelling and injection of the blood vessels. The parts of the larynx most affected are the ventricular bands, the inter-arytenoid fold, and the vocal cords. The congestion may affect one cord or both, and the swelling of the inter-arytenoid fold, or of the ventricular bands interferes greatly with the proper mobility of the cords. Slight erosions may occur, but true ulceration is so exceedingly rare after simple catarrhal laryngitis as to be denied by many authors. As a result of catarrhal inflammation of long standing papillomata are sometimes developed.

The causes giving rise to chronic inflammation of the larynx are similar to those originating the acute form of which it is often a sequel. Frequent exposure to cold and wet, over-exertion of the voice, the abuse of tobacco, the inhalation of air containing injurious substances, as in the case of needle grinders, workers in chemical factories, &c., may be all concerned in the etiology of the disease. It not unfrequently occurs as a sequel or concomitant of a similar condition in the pharynx, and it is found as a secondary affection in cancer, phthisis, syphilis and other laryngeal diseases. A very long and relaxed uvula may perhaps occasionally set up symptoms of chronic laryngeal catarrh by its irritation of the region.

In the treatment of this affection, local measures are of great value. The application by means of a brush, guided by the laryngeal mirror, of some astringent solution, as of chloride of zinc, perchloride of iron, sulphate of copper, or alum, should be made at frequent

intervals, the length of time between the applications being increased as the condition improves. Some authors also recommend sprays, but I think these are only of value for the pharyngeal affection and are of little real use for the larynx. At the same time with local applications, inhalations of medicated steam should be used, the most valuable being those of creosote, pine oil, and camphor.

Combined with these local measures there should be as complete and absolute rest to the voice as possible. Constitutional remedies, suited to the catarrhal condition, should be given and a change of air to the seaside, or a winter in an equable climate may be advisable. Patients liable to chronic laryngitis should be very careful to avoid sudden changes of temperature, and throughout the winter a respirator should be worn, except under exceptionally favourable circumstances.

There is a form of chronic laryngitis known as "Glandular, follicular, or granular," which is usually associated with follicular pharyngitis or "clergyman's sore-throat" (see p. 64). The symptoms are the same as those of simple chronic laryngitis, but examination with the laryngoscope shows the enlarged glands on the epiglottis and vocal cords. Treatment is similar to that of the simple form.

Tubercle in the Larynx.—Laryngeal Phthisis. Phthisical Laryngitis.

The deposit of tubercle in the larynx is by no means uncommon, occurring, as I have said (see p. 28), in about 30 per cent. of cases of pulmonary phthisis. Evidences of pulmonary tuberculosis almost invariably precede symptoms and signs of tubercle in the larynx, though in some cases the latter may be discovered while physical signs in the lungs are absent.

Sufficient evidence, however, has not yet been produced to show conclusively that tubercular deposit in the larynx ever really takes place prior to its occurrence in the lungs.

The symptoms of laryngeal phthisis in the early stages are not well marked and are similar to those of chronic laryngitis. As swelling increases, pain and difficulty of swallowing is more evident, cough increases in frequency, and the voice becomes more affected. Difficulty of swallowing is perhaps one of the most marked features of the affection, and should always excite suspicion and lead to examination of the condition of the lungs. As the disease advances, this symptom increases in severity, and ultimately the taking of food, liquids especially, becomes almost, if not quite, impossible, the food either getting into the larynx or returning through the nostrils. Cough is also generally a prominent symptom, and is frequently most irritating and exhausting to the patient. The voice is generally more or less affected from the first, and may be entirely lost. This is due to swelling interfering with the proper approximation of the cords, to ulceration of the cords themselves, or to loss of power in the motor nerves of the larynx, a part of the general loss of power of the patient. The expectoration does not reveal much. There are also, of course, usually the general symptoms of phthisis, loss of flesh, fever, night-sweats, and perhaps diarrhoea, though sometimes there is obstinate constipation, the bowels rarely acting without assistance.

Examination with the laryngoscope shows, if the case be seen very early, an anæmic condition of the laryngeal mucous membrane. This, however, is soon succeeded by congestion, similar to that of ordinary chronic laryngitis. As the disease advances there will be seen to be thickening of the epiglottis, more frequently con-

siderable swelling of the ary-epiglottic folds, causing the ventricular bands to almost or entirely close over the vocal cords and prevent their being seen, as in Figs. 25, 26, and 27, which are all taken from the same patient on different occasions.

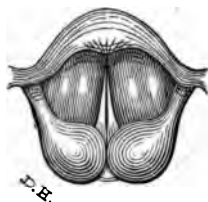


FIG. 25.

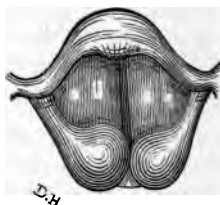


FIG. 26.

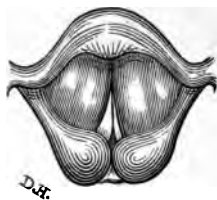


FIG. 27.

This pyriform swelling of the ary-epiglottic folds is generally considered as pathognomonic of laryngeal phthisis.

Very frequently also, there are developed in the posterior commissure of the larynx, small villous-like growths, which give the appearance described by French authors as "*aspect velvétique*" (Fig. 28), and which some of them consider as a pathognomonic symptom of phthisis. According to Isambert, the intensity of the cough seems proportional to the amount of these granulations in the posterior commissure.

The thickening of the epiglottis frequently becomes extreme (Fig. 29), and sometimes it assumes the shape of a horse-shoe, being as it were folded on itself (Fig. 30).

As the disease progresses, ulceration occurs. This generally first attacks the vocal cords which become serrated, especially at the posterior part. Ulceration then proceeds to the arytenoids, the inter-arytenoid commissure and the epiglottis. Fig. 31, after Mandl, shows ulceration of the vocal cords, and great swelling and inflammation of the right arytenoid and ary-epiglottic fold.



FIG. 28.



FIG. 29.



FIG. 30.



FIG. 31.

The third and final stage is that of suppuration and necrosis or caries of the laryngeal cartilages. The cartilages of Wrisberg and Santorini are those usually first attacked, then the epiglottis, the thyroid and the cricoid. In some cases the necrosed portion of cartilage is thrown off and expelled by expectoration.

As the disease advances, of course, the subject symptoms of cough, dysphonia, and dysphagia increase in severity, the last-named especially becoming most distressing and making the slightest attempt at deglutition, literally "pain and grief" to the patient.

With regard to the exciting cause of tubercular laryngitis, it is "almost invariably to be found in the previous existence of pulmonary phthisis" (Mackenzie). The predisposing causes are, of course, therefore, those of pulmonary phthisis.

Why in some cases of phthisis the tubercular deposit should occur in the larynx, whilst in others that organ escapes, it is difficult to say, but is probably due to a weakness of the part, either inherent or induced by frequent attacks of catarrhal inflammation or an overstraining of the vocal organ.

As to the treatment of laryngeal phthisis, much may be done by regular and judicious local measures to alleviate the sufferings and prolong the life of the patient, though the ultimately fatal result is only too sure. In the early stages, applications of mineral astringents, as chloride of zinc, nitrate of silver, perchloride of iron, are valuable. With these should be given soothing vapour inhalations, as benzoin. Dr. Cadier, of Paris,* has great faith in creosote, which he employs both locally and internally. Foreign authorities also are greatly in favour of spray inhalations which are not so much employed in this country. Inhalations and applications of iodine are much recommended by some writers. I have myself seen considerable benefit and great relief to the cough by the constant inhalation, with the respirator inhaler, of carbolic acid and creosote, giving the lungs a constant antiseptic atmosphere. For relieving pain and difficulty

* *The Specialist*, Feb. 1881.

of swallowing, applications of morphia, either by insufflation or in solution, are often efficacious. With the morphia in solution may be combined chloride of zinc, or other astringent, or it may be made into a thick application with bismuth, gum and glycerine. Where the dysphagia is great, all food should be of a semi-solid consistence, and drinks should be gulped, not sipped.

The question of scarification is a somewhat open one. At the recent International Laryngological Congress at Milan, its utility was strongly advocated by Professor Schmidt of Frankfort,* but in this country, Mackenzie only recommends it when the œdema is very great, and Lennox Browne condemns it as of most doubtful propriety. Marcet, in 1869, recommended it "in the swollen and indurated form of laryngeal phthisis," but, not when the mucous membrane is *extensively* infiltrated with tubercular deposit.

Tracheotomy may be demanded if there is very urgent dyspnœa, and it has been recommended by Dr. Beverly Robinson, in the earlier stages, as a means of giving rest to the larynx, and thereby facilitating a process of cure. Evidence, however, seems to be against the production of any good effect by tracheotomy in this disease.

Of general treatment it is not necessary here to speak; it must be that of phthisis generally. Climatic change in the early period may do much towards the arrest of the disease, and good diet, regular hours, pure air and exercise will be as valuable in this as in other forms of phthisis.

Syphilis of the Larynx. Syphilitic laryngitis.

The manifestations of syphilis in the larynx (see p. 27) appear in the secondary stage, as erythema, condylomata, superficial ulceration, and obstinate con-

* See Dr. Schmidt's paper, translated by the Author, in *The Specialist*, April, 1881.

gestion. Tertiary manifestations include gummata, ulceration and stenosis from cicatricial contraction. The ulceration in this stage often extends deeply, causing perichondritis, with caries of the laryngeal cartilages.

The first symptoms of syphilis in the throat are those of ordinary sore-throat, tickling, deep cough, hoarseness of voice, sometimes going on to aphonia. Examination at this time will show a general congested catarrhal condition of the larynx, soon to be followed by the development of mucous patches or condylomata. There is some difficulty of swallowing, but not pain, when the parts are at rest. The condylomata appear as "smooth yellow projections, sometimes round, but more often oval, varying in diameter from 3 to 7 millimetres, but in some rare cases attaining the breadth of a centimetre" (Mackenzie). They may occur on the vocal cords, but are probably more common on the epiglottis and the inter-arytenoid fold. The period at which these appear, after the primary infection, varies from a few months to a year.

Simple syphilitic ulceration occurs at a somewhat later period; one or two years, perhaps, after the primary infection, and after the patient has already had other secondary symptoms.

In the tertiary stage, the symptoms are hoarseness or aphonia, hard cough, profuse expectoration, with occasional hæmoptysis, and more or less intense dyspnoea. This is due to contraction of the larynx from cicatrisation, and the formation of growths. Examination shows, as an early symptom, an obstinate superficial ulceration; a condition which Dr. Whistler* describes as "relapsing ulcerative laryngitis." This may occur either immediately after the secondary

* Lectures on Syphilis of the Larynx. London: Churchill. 1879. P. 59

symptoms just mentioned, or not until "three or four or more years after the primary sore." Dr. Whistler classifies these ulcerations as belonging to an intermediate period, between the secondary and tertiary stages. They affect usually the vocal cords.

The most marked and usual symptom of tertiary syphilitic laryngitis, however, is deep and destructive ulceration. This usually first attacks the epiglottis, which, after becoming much thickened, commences to ulcerate on its upper surface. This causes much pain and difficulty in swallowing. The ulceration is often very extensive in its ravages, and is most deep and serious when it results from the breaking down of gummata, which are, at this period, sometimes developed in the larynx.

When the ulceration heals or is arrested, the resulting cicatrices often cause considerable danger by the amount of stenosis that may be produced by their contraction. In some cases, a distinct web is formed between the cords, uniting them together, and leaving sometimes an extremely minute glottic opening.

Laryngoscopic examination, of course, will easily reveal this destructive process.

With regard to the cause of syphilitic laryngitis, the reason why, in some cases of syphilis, the larynx should be attacked while it escapes in others is not clear. It would seem, however, that the fact of the frequent occurrence of sore-throats previous to the exposure to the primary infection, renders this region more susceptible to the action of the poison. It is, in fact, a *locus minoris resistentiæ*.

The treatment of syphilis of the larynx must be pursued very much on the lines laid down when treating of the same disease in the pharynx (p. 76). If there is considerable œdema which does not yield to iodide of potassium, scarification, or even tracheotomy, may be

necessary. Cicatricial webs may be divided by some form of cutting-dilator, as that of Dr. Whistler, or by the galvano-cautery.

Perichondritis of the Larynx.

Primary inflammation of the membrane covering the laryngeal cartilages is rare, but perichondritis not unfrequently occurs as a result of deeply extending ulceration of a tubercular, syphilitic, or cancerous nature. In the course of such deep ulceration the pus finds its way beneath the perichondrium, which it detaches from the subjacent cartilage, and the latter being thus deprived of its nutrient supply undergoes a process of caries or necrosis, softening and breaking down into dirty yellow or blackish brown fragments, enveloped in ichorous pus. In some instances these necrosed portions of cartilage are expelled, and in the case of small cartilages like the arytenoids, the abscess may collapse and heal.

The symptoms of perichondrial ulceration are not very clear, as it is often difficult to distinguish them from those of the primary disease which has originated the perichondritis. Those which should make us suspect such a state of affairs are circumscribed painfulness of a cartilage, cough, hoarseness, swelling of the lymphatic glands, &c. As the disease progresses and the distended perichondrium is pushed further into the laryngeal cavity, dyspnoea increases. This period is frequently fatal, but in some cases the abscess bursting, the pus is discharged, carrying with it perhaps portions of the necrosed cartilage, and the symptoms of suffocation disappear.

In some few cases the pus makes its way outwards, resulting in the formation of abscesses and sinuses in the neck.

The appearances presented are very various accord-

ing to the cartilage attacked, but are by no means definite in many cases. Sometimes the swelling caused by the raising of the perichondrium may be seen below the cords. If a cartilage be expelled, such as one of the arytenoids or of Santorini, this will be followed by marked falling in of the walls at that spot. The vocal cords will be seen to be paralysed when the inflammation has attacked the plate of the cricoid cartilage.

The causes of perichondritis have been already touched upon. They are usually tubercle, syphilis, or cancer. The disease may, however, arise primarily and independently, or may be due to traumatic causes or rheumatic influences. As regards treatment, there is not very much to be done. Ice externally and internally, counter-irritation outside the neck may be used in the earlier stages. When abscesses point externally they must be opened. If stenosis supervene, scarification must be tried, or if possible the abscess may be opened with the laryngeal lancet. Soothing inhalations may be given. Tracheotomy will often be required, and in some cases after its performance the disease may be cured, especially if syphilitic in origin, but it generally leaves so much stenosis that the patient will have to wear the canula the rest of his life. Various means of dilating the larynx have been devised, the best of which is probably that of Schroetter, which may be employed for some hours at a time, as it allows of free respiration through the tracheal tube.

Morbid growths in the Larynx.

Neoplastic formations in the larynx may be either malignant or non-malignant in character (see p. 26). The non-malignant polypi are generally fibrous, fibro-cellular, papillomatous, myxomatous, or adenomatous. The *papilloma* is the most common, and the most fre-

quent seat of its origin is on the vocal cords, near their anterior extremities. Papillomata are very apt to recur, especially if incompletely extirpated.

Fibroma, or *fibrous polypus* is probably the next most frequent in occurrence. It is usually single, and originates generally from the vocal cords. It is not apt to recur.

Mucous polypi and *cysts* are not common. They usually arise from the ventricles. Cysts are also found on the epiglottis. These forms of polypi grow slowly and do not show much tendency to relapse.

The other varieties of polypi in the larynx, lipomata, adenomata, &c., are very rare.

The malignant tumours of the larynx may be carcinomatous, or sarcomatous. Of *cancer*, the form most frequently occurring is epithelioma (see p. 26). This usually attacks the upper and middle portion of the larynx, originating in the vocal cords, ventricular bands or ventricles, and spreading upwards. In some cases the growth commences in the epiglottis or ary-epiglottic folds.

Sarcomata are rare; they are generally found on, or near, the vocal cords, and are very prone to recur.

The symptoms of morbid growths in the larynx are mostly those caused by interference with function. They are dyspnoea, cough, the feeling of the presence of a foreign body in the throat, dysphonia, dysphagia, and pain. The latter symptom is most marked in the case of malignant growths, when it is often very severe and extends towards the ears. The severity of the other symptoms of course varies with the position of the growth. Hoarseness is said by Von Ziemssen to be an early and lasting symptom of laryngeal cancer, and often precedes other symptoms for a long time. Fœtor of the breath is present when ulceration commences in carcinoma, and hæmorrhages also occur.

The certain diagnosis of the presence of a morbid growth in the larynx is, however, made by the laryngoscope. *Papillomata* appear as light or dark red tumours, multiple and varying from the size of a millet seed to that of a bean, as whitish-grey papillated tumours, with broad bases, or as reddish mulberry- or cauliflower-like growths attached to the false cords. Fig. 32 represents a papillomatous growth, growing from above the left vocal cord.



FIG. 32.

Fibromata appear as round or pear-shaped, smooth, brightish-red excrescences, almost always single, varying in size from a split pea to a hazelnut. Von Ziemssen describes one larger than a walnut.

Mucous polypi and *cysts* appear as round, egg-like projections, proceeding from the ventricles, or situated on the epiglottis.

Assistance in the diagnosis of laryngeal tumours is given by the use of the sound, by which their consistence and their exact seat of origin may be more clearly made out.

In *cancer*, the tumour first appears somewhat undefined and not characteristic. In the case of *epithelioma*, however, there soon appears the characteristic cancerous ulceration, with indurated and inverted edges, and an uneven surface covered with clots.

The mucous membrane of the larynx becomes of a

deep red colour; the neighbouring glands become affected, and are hard and swollen.

The causes of morbid growths in the larynx are obscure. Frequently repeated catarrhal attacks seem to have something to do with the etiology of the non-malignant growths. Accordingly, as Von Ziemssen says, "all the injurious influences which may result in laryngeal catarrh are of decided influence in the production of laryngeal polypi." Polypi of the larynx are more frequent among men than women. The majority of cases occur in middle age (from 20 to 50 years). Cancer is more prone to appear at advanced age, but the reasons for the localisation of the affection in the larynx are still unexplained.

As to the treatment of laryngeal growths the indication is for their removal, or in cases of malignant disease for the extirpation of the entire larynx. There are various methods of removal, some *per vias naturales*, through the mouth, others by making an incision into the larynx from without. In this little work it will only be possible to consider these very briefly.

The endo-laryngeal methods, through the mouth and pharynx, are of course the safest, and with precautions, guided by the mirror, not usually very difficult to one practised in the use of the laryngoscope. The means adopted for removing growths by this method are by cauterisation, by cutting instruments, by the snare or *écraseur*, by forceps and crushing instruments and by galvano-cautery and electrolysis. The means perhaps most commonly employed are the forceps and the *écraseur*. The latter instrument is especially adapted for small growths with small or pedunculated bases (see p. 43). Evulsion with forceps, Mackenzie considers to be applicable to all growths except cysts. Crushing may be used in some cases of firmly attached growths, but they will probably be more satis-

factorily dealt with by a cutting instrument. Chemical caustics and escharotics are tedious and painful in their action, and may give rise to spasm of the larynx.

Galvano-cautery has been very successful in the hands of some eminent authorities.

When it is intended to remove a growth by the endo-laryngeal method, the patient must be prepared for the operation. He must become accustomed to the presence of instruments in the larynx, and able to bear them well. Any existing congestion of the pharynx, fauces, uvula, &c., must be got rid of. If the parts are very sensitive, a little ice sucked just before the operation will help to diminish the sensibility. The patient should be instructed to hold out the tongue himself, and all instruments introduced into the larynx should be warmed. Of course, the laryngeal mirror must always be employed to enable us to see where the instrument is going.

In some cases it will be necessary to remove the growth by cutting into the larynx from without. This may be necessary on account of size of the growth, extreme irritability of the throat, the occurrence of spasm when instruments are introduced into the glottis, or the malignant nature of the tumour. This method of extirpation of growths may be carried out in three ways. "1st. By division of the thyroid cartilage or thyrotomy. 2ndly, by supra-thyroid laryngotomy, or division of the thyro-hyoid membrane, and 3rdly, by infra-thyroid laryngotomy (through the crico-thyroid membrane), or tracheotomy." (Mackenzie.) The size of this work prevents my entering into the details of these operations, their indications, and the methods of their performance, but all this will be found fully discussed in larger works, especially in that of Dr. Morell Mackenzie.

In regard to malignant tumours, in addition to the

methods of removal mentioned, there remains the complete extirpation of the larynx. This operation, first performed by Billroth in 1873, has been repeated a considerable number of times with a promising amount of success. A description of the method of operation will be found in *The Lancet*, for October 13, 1877, by Dr. Foulis, of Glasgow, the first to perform the operation in this country.

Any other efforts in the way of treatment in malignant disease must be palliative. Feeding per rectum may be necessary. Pain may be soothed by application of morphia, by insufflation especially.

Foreign bodies in the Larynx.

The entrance of foreign substances into the larynx is by no means uncommon. Fish bones, coins, pins, artificial teeth, are perhaps among the most common. Some very remarkable substances are recorded as having been removed from the larynx.

The symptoms vary with the size and nature of the body. They always consist in more or less embarrassment of breathing and voice, pain, and discomfort, perhaps hæmorrhage if the substance be sharp. A small body may not cause much symptom beyond a sensation of pricking. Cough is frequent, and in some cases is effectual in causing the expulsion of the offending substance. Examination with the laryngoscope will usually reveal the presence, nature, size, and position of the body.

It must not be forgotten that the sensation of the presence of a foreign body may remain long, perhaps, after it has been expelled by the natural effort, without the knowledge of the patient, whose feelings make him believe it is still there. Danger is caused, not only by the fact of the body itself interfering with respiration, but also by its setting up inflammation by its presence,

which may remain or even increase after its expulsion or removal.

As to the cause of the entrance of foreign bodies into the larynx, it usually takes place when eating or during sleep. In the former case, the patient has probably laughed or inspired strongly while masticating, and a portion of the food has thus been drawn into the air passage.

The indication for treatment is of course early removal. Laryngoscopic examination should be made, and the position and size of the substance being ascertained, attempts should be made to remove it with forceps. If the symptoms of dyspnoea are urgent, tracheotomy should be done at once, and then the endeavours at removal made. Other methods, as by turning the patient upside down, &c., may be tried.

Neuroses of the Larynx.

Neurosal affections of the larynx may be either sensory or motor.

Neuroses of Sensation.—If the nerves of sensation be affected, we may have anæsthesia, hyperæsthesia, paræsthesia, or neuralgia. Anæsthesia of the larynx is found in diphtheria, and bulbar paralysis, and may be present in hysteria. The symptom causing most trouble is dysphagia, from substances swallowed, especially if fluid, getting into the larynx, no cough or reflex spasm being produced. Associated with anæsthesia of the larynx, there is generally some paralysis of the muscles acting on the epiglottis. The diagnosis may be made sure by the use of the laryngeal probe. Treatment consists in the application of the electric current to the parts, the use of the œsophageal tube for feeding the patient, and the administration of tonic remedies, especially strychnine which should be used hypodermically.

Hyperæsthesia and paræsthesia may occur in connection with laryngeal inflammation and ulceration, or independently, in very nervous, hysterical, or hypochondriacal patients. True neuralgia of the larynx is exceedingly rare, but may result from cold or follow inflammation.

The symptoms are those of pain, increase of sensation, or the feeling of some foreign body in the throat. There is often a frequent nervous or spasmodic cough.

Treatment must be directed to the improvement of the general health of the patient. Locally, in cases of neuralgia the application of chloroform and morphia was found very successful by Schnitzler. Many cases of perversion of sensation in the throat appear due to rheumatism, and iodide of potassium should be tried.

Neuroses of Motion.—Paralysis of the motor nerves of the larynx may be due to central or peripheral causes. I shall consider these in connection with the groups of muscles affected.



FIG. 33.

1. Paralysis of the adductors of the vocal cords. (Crico-arytænoidei laterales, and arytænoideus.) This may be bilateral or unilateral. The chief symptom of bilateral paralysis is aphonia, coming on suddenly in a person otherwise apparently healthy. Laryngoscopic examination shows the laryngeal mucous membrane healthy, with no swelling, ulceration or growth, but on the patient attempting to phonate it will be seen that the cords remain separated.

Fig. 33 represents the position of the cords on attempted phonation in a case of this kind. The mucous membrane may in some cases be somewhat congested if the paralysis has followed catarrh.

With regard to cause, these cases are most usually due to hysteria, and are, therefore, much more common in the female than the male sex. It may also occur in phthisis, may remain as a sequel of catarrhal laryngitis, or may be connected with rheumatism.

In unilateral paralysis, where only the adductors of one side are affected, the voice becomes shrill and harsh. Laryngoscopic examination shows that on phonation, while one cord moves to the median line the other remains at the side.

In the treatment of this form of paralysis, endeavours must be made to stimulate the muscles. While the general health is improved and anti-hysterical remedies administered, locally, stimulating inhalations may be used, as ammonia, creosote, &c., and solutions of nitrate of silver applied with the brush. If these fail, the application of electricity by means of the necklet and electrode figured on page 44, will almost always restore the function. In the case represented in Fig. 33, where the voice had been lost for more than 12 months, three applications of an electro-magnetic current, at one sitting, sufficed to restore it. If there be any existing congestion of the larynx, it must be removed before applying electricity.

2. Paralysis of the central adductor (arytænoideus). In this case there is aphonia, and laryngoscopic examination during phonation shows the cords in contact for the anterior $\frac{3}{4}$ only of their length, the posterior portion showing a triangular opening.

Hysteria is the usual cause, but it may also occur in acute catarrh. Treatment will be much the same as in the class of cases just described.

3. Paralysis of the internal tensors (Thyro-arytænoidei interni).

The symptoms of this paralysis vary from a slight disturbance of the voice to very great hoarseness. Laryngoscopic examination shows the cords on phonation separated in the middle third though approximating at the extremities. The glottic opening is, therefore, of a pointed oval shape.

This affection may occur as the result of "severe and long-continued catarrh, of continuous over-exertion of the voice in prolonged speaking, singing, loud crying and calling." It is, therefore, not uncommon among public singers. With regard to treatment, rest for a short time from functional exertion will often effect a cure, though some cases last a long time. Electricity is useful.

4. Paralysis of the abductors. (Crico-arytænoidei postici.) This is the most serious form of laryngeal paralysis. In bilateral paralysis, the glottic opening is closed and respiration seriously interfered with. The chief symptom, therefore, is difficulty of inspiration, which is noisy and stridulous, while expiration is noiseless and easy, and the voice little if at all affected. Laryngoscopically, on inspiration the cords are seen to remain nearly approximated, opening slightly perhaps on expiration.

With regard to cause, it is somewhat obscure. Of the nine cases reported by Von Ziemssen, two depended apparently on "primary neuropathic paralysis, in one instance of the trunk of the recurrent, in the other of the trunks of the pneumogastric and spinal accessory." In a third case, these nerves were intact. Of the other cases, one began with catarrh, one was preceded by typhoid fever, and one followed pneumonia secondary to erysipelas. The remaining three remain obscure as to cause.

Treatment will usually be best commenced by the performance of tracheotomy. At any rate the operation should be performed, unless other methods of treatment soon cause improvement. These other methods are, such as would be appropriate to hysteria, syphilis, and catarrh, if either of these be present, the hypodermic injection of strychnine and the application of electricity.

In unilateral paralysis of an abductor, the breathing is stridulous, the voice somewhat impure, and the laryngoscope shows that on inspiration one only of the cords moves away from the median line. It may be due to catarrh, and Mackenzie has seen two cases due to syphilis. As to treatment, any catarrhal condition must be met with the usual remedies, and when this is removed electricity may be applied. Syphilis, of course, requires iodide of potassium.

Spasmodic affections of the Larynx.—Spasm of the glottis; laryngismus stridulus; false croup; spasmodic croup. All these names are employed as synonymous titles of a nervous affection, not very uncommon in weakly, ill-nourished children, in which there is spasm of the adductors of the vocal cords. The symptoms often come on in the night. The child commences to inspire noisily, each inspiration being somewhat more difficult than the last, until at length the glottis seems to close altogether. The head is then thrown back, the thorax remains motionless, the countenance assumes an expression of terror, with eyeballs staring, mouth open, and nostrils dilated. Death indeed seems imminent. The fatal event, however, by no means always ensues; after a brief interval the spasm relaxes and a crying or whistling inspiration takes place. The attacks may be repeated at intervals, and then cease altogether, or in one of them the infant may be carried off.

With regard to the causes of laryngismus stridulus,

age is an important factor. The majority of cases occur between the ages of six months and two years. Rachitis is a marked condition in a large number of cases; amongst the upper classes the affection mostly attacks children brought up by hand, and amongst the poor it will generally be found that the children who suffer are badly or insufficiently fed, and live in an unhealthy atmosphere. Teething is by many considered to have much to do with this affection, but the fact is still somewhat undecided. Swelling of the bronchial and tracheal glands may cause it by pressure or irritation of the pneumogastric or recurrent nerves. Prolonged crying, the entrance of milk into the larynx, the presence of catarrh, &c., may act as exciting causes.

As to treatment: we shall probably be called when the child is in the "fit," and the first thing to be done is to endeavour to relax the spasm. For this purpose the child should be raised up, cold water thrown in the face and ammonia applied to the nostrils. A warm bath should be given, and an emetic administered as soon as the child can swallow. Vomiting may also be excited by tickling the fauces, if the mouth is open, or by a hypodermic injection of apomorphia (Steffen). Of anti-spasmodics, the best is musk, a fact testified to by Reid, Steffen, Mackenzie, Salathé, &c. If the exciting cause can be discovered it must be removed. When the spasm has ceased, means must be taken to improve the general condition of the child. When rachitis is present, iodide of iron and cod-liver oil are indicated. Derangement of the digestive system may be treated by hyd. c. cretâ, with soda, &c. Great care must be given to the feeding, food being given only in proper quantities, and at proper intervals, and fresh air, bathing, &c., will help to bring the child into a healthy condition.

Spasm of the glottis occasionally occurs in adults, and is probably generally hysterical.

CHAPTER VII.

DIPHTHERIA.

I cannot enter here into any lengthened discussion of the vexed question of the identity of diphtheria with membranous croup. I am disposed to believe that a very great deal of the confusion has arisen from a loose and indiscriminate application of different terms by the writers of different nations, who were all along describing the same disease. Strictly speaking, no doubt the word diphtheria, looking at its etymological origin, should be applied to all cases accompanied by the development of false membrane. In consonance with this idea, and after careful study of various writers on the point, I shall follow Dr. Morell Mackenzie and most of the leading authorities of the present day, and apply the term diphtheria to both the pharyngeal and laryngeal forms of the disease, the latter, laryngo-tracheal diphtheria, being the affection which was formerly called croup. I think it is certainly to be desired that the word croup, which is often applied to any throat affection in which there is present what is called a "croupy" cough, should be, if not abolished, at any rate restricted in its application to some one definite form of throat affection. As giving a clear, succinct, and yet comprehensive description of the chief features of diphtheria, I take the following definition of it from Dr. Mackenzie: "A specific communicable disease, occurring epidemically, endemically and solitarily, and characterised by more or less inflammation of the mucous membrane of the pharynx, larynx, or air-passages, and by the formation on the surface of those parts—especially on the mucous membrane of

the fauces and wind-pipe,—of a layer or layers of lymph or false membrane, generally showing signs of bacteroid mycosis. During an epidemic, other mucous surfaces exposed to the air, and wounded surfaces of the common integument occasionally, but less frequently, become covered with a layer of lymph, subsequently to, or independently of, a formation of membrane in the more ordinary situations. The disease is generally of an adynamic character, is often associated with a disturbance of the renal function (albuminuria), and is frequently followed by lesions of innervation, rarely giving rise to permanent paralysis. The symptoms, as regards respiration, vocalization, and deglutition, vary with the site of the disease. By far the larger proportion of fatal cases terminate by gradual apnoea, but a certain percentage sink from asthenia, blood-poisoning, and cardiac thrombosis."

As stated above, the symptoms vary with the site of the disease, and also, of course, with its degree of intensity. In slight cases there may be little beyond a feeling of sore-throat with congestion of the mucous membrane, sometimes not even the formation of false membrane. Two principal forms of the disease, however, may be described, the ordinary or typical, and the malignant.

An attack of ordinary typical diphtheria commences, after a period of incubation of from two to five days, with feverishness, nausea, and headache, soon followed by soreness of the throat, with pain in swallowing. Examination of the throat at this stage will show the fauces, tonsils, and pharynx, reddened and congested. In a few hours, false membrane will be developed in the form of an exudation, commencing in small spots, which coalesce and unite so as to form large patches, or to cover the whole surface of the regions. In colour the exudation may be yellowish, greyish-white, some-

times dark and brownish, and in consistence it ranges "from cream to wash-leather." If this membrane be detached, the mucous membrane beneath will be found raw and bleeding, and will soon be covered with a fresh deposit of exudation. The temperature often falls as the exudation is deposited, but other constitutional symptoms, weakness of pulse, feebleness of cardiac action, and general debility, increase. Albuminuria is frequently present. In some cases the membranous deposit spreads downwards into the larynx and trachea, making the case one of laryngo-tracheal diphtheria (true croup), and thereby adding much to the gravity of the prognosis. Other passages in the vicinity may also be involved. The nasal cavity may be implicated, and this is a most serious extension; for, as Trousseau says, "The cases in which it happens almost invariably prove fatal, if not in the acute, in a later stage of the disease." Extension to the nasal passages causes the discharge of a dark, foetid fluid, sometimes epistaxis, and the membrane is deposited on the nasal mucous membrane. Extension may also take place through the Eustachian tube, and the diphtheritic membrane be deposited there and in the middle ear. The symptoms caused by this would be pain darting into the ear, deafness, tinnitus, and otorrhœa.

After a week or ten days, if the case is tending to a favourable issue, a diminution in the severity of the symptoms takes place. The extent of surface covered by exudation does not increase, and the membrane is loosened and detached. The constitutional symptoms abate, appetite returns, and the patient appears on the high road to health.

In other cases, however, where the tendency is to an unfavourable turn, blood-poisoning may ensue, or death may take place from syncope.

Cases of diphtheria sometimes occur, which are scarcely

distinguishable by their symptoms from ordinary catarrhal sore-throat, and it is only the supervention of paralysis which shows what the real nature of the affection has been.

In the malignant form of diphtheria, the commencing symptoms are more severe, the breath is very fœtid, and the patient rapidly sinks into what is known as the typhoid state, becomes delirious or comatose, and dies of syncope.

The laryngo-tracheal form of diphtheria may be primarily developed in the larynx, may descend there from the pharynx, or may ascend there from the bronchi and trachea, but the last named course is very rare. The first symptoms are those of general malaise, with hoarseness, and a dry, hard, cough. There is feverishness and some dyspnœa. Laryngoscopic examination shows a reddened larynx with some patches of false membrane. As the affection progresses, difficulty of breathing is greater, cough becomes more hoarse, and spasmodic attacks occur, which gradually become more and more frequent, the other symptoms at the same time being aggravated until death takes place from suffocation, coma, or exhaustion.

The sequelæ of diphtheria are important, the worst being paralysis. This may occur at almost any time after the affection up to six weeks. Most frequently the paralysis begins in the throat and palate, causing difficulty in swallowing; the muscles of the eye are not unfrequently affected, and also those of the extremities, commencing in the fingers and toes, and extending upwards; power of voluntary movement being lost, as well as sensation. The bladder sometimes becomes involved. Paralysis of the larynx after diphtheria is rare, and when it does occur may either involve the whole larynx or single muscles only. In the latter case the adductors are those most commonly affected.

Should the heart become affected, serious symptoms ensue, the organ gradually slowing and ultimately ceasing to beat. These paralytic symptoms may last from six weeks to six months. If the heart or respiratory muscles are not affected, recovery generally takes place, very gradually as a rule, according to the extent and amount of the paralysis.

The cause of diphtheria is a specific septic virus. While some think this virus exists only in the membranous exudation, others are of opinion that the contagion may be conveyed in the breath and the excretions. The period during which the infection lasts after convalescence is variable and uncertain. The conditions which predispose to diphtheria are childhood, bodily exhaustion, and anything which tends to lower the vital powers. Predisposition sometimes runs in families.

Treatment of diphtheria must be both general and local. The general treatment must be essentially of a supporting character, since the vital powers are always much impaired. A moderately warm, well-ventilated room, the atmosphere of which is kept moist, should be provided, and a very nourishing and at the same time easily digested diet must be given at regular short intervals, by night as well as by day. The question of the administration of alcoholic stimulants will be decided by each practitioner in accordance with his own views as to their value, but I believe that in almost all cases it is well to give small quantities. The claim to the title of a specific for this disease has been made at different times on behalf of various drugs, but none of them, unfortunately, have been able to stand the test of extended trial. Other remedies which have been found useful are employed for their action, either as general tonics and restoratives, such being quinine and iron, especially the perchloride, or as antiseptics,

the principal of these being the salicylates, carbolic acid and the sulpho-carbolates, recommended by Dr. Sansom, chlorate of potash, &c. The last-named remedy is much advocated by many authors, and Dr. Wade recommends iodide of potassium to be combined with it. Adynamia will of course require such remedies as ammonia, bark, camphor, &c. The bowels should be kept open by a saline aperient if required, and a drink containing chlorate of potash given.

As regards local treatment, its nature and extent, authorities differ. Some, as Trousseau, advocate the tearing off of the patches of false membrane, whilst others insist that this should on no account be done. Some again advise the application of strong caustics as hydrochloric acid, nitrate of silver, and perchloride of iron, while other equally eminent writers discountenance them. Agents which tend to dissolve the membranous exudation are much employed. The principal are lime water, liquor potassæ, and lactic acid. The last-named, Mackenzie has found the most reliable, applied freely with a brush or piece of lint attached to a wooden rod. Antiseptic applications are also valuable, such as carbolic acid (gr. 2-3 to 1 oz.), permanganate of potash, chlorate of potash, sulphurous acid, chloral hydrate, &c. If the patient can use it, these remedies may be given in the form of gargle. If not they may be given in spray or as mouth-washes. The sucking of ice often affords great comfort. When the membrane is fully developed, the air of the room should be kept moist with steam, and steam inhalations, either plain or medicated with some antiseptic agent, as carbolic acid, should be assiduously used by the patient. In the case of children, what is known as a "croup-tent" should be used, and the air within it kept impregnated with steam. In the case of laryngo-tracheal diphtheria in children, in the early stages the

spray-inhalation of lactic acid should be employed. When the false membranes are fully formed, emetics have frequently been efficacious by causing their expulsion. If there be shreds or portions of detached exudation lying in the larynx, endeavours should be made to remove them by means of a brush. If these means fail, now is the time for tracheotomy, which, as Mr. Parker* says, "is indicated in cases of increasing and persistent dyspnoea, when due to disease, or mechanical obstruction in the larynx or adjoining part of the trachea," and again p. 67, "retraction of the soft parts of the anterior chest-wall, together with the more or less complete suppression of voice, are the indications, *par excellence*, for its performance." Into the details of the performance of this operation, and the particulars of the after-treatment, as to the paramount importance of which I quite agree with Mr. Parker, I do not intend here to enter, but would refer all interested in the subject to that surgeon's work, and to the sections on laryngo-tracheal diphtheria, and on tracheotomy in Dr. Mackenzie's Manual.

Where the result in diphtheria is a favourable one, the patient will require care during convalescence. Tonics, sea-air, cod-liver oil, &c., will be advisable. If paralytic symptoms supervene, quinine and strychnine may be of use; difficulty of swallowing may necessitate feeding by a tube. Galvanism and furadism may be applied to the paralysed parts sometimes with advantage.

I at one time thought of concluding this work with tables of formulæ, but most of those which I have

* Op. cit., p. 17.

found of value and am in the habit of using almost identical with those which will be found in the "Throat Hospital Pharmacopœia," the new edition of which contains a most comprehensive list of reliable prescriptions. I would, therefore, refer readers to the pages of that work for suitable formulæ for the treatment of throat affections, locally and generally.

THE END.

INDEX.

- Abductors, Paralysis of**, 110.
- Abscess of Naso-Pharynx**, 54 ;
 Retro-Pharyngeal, 70.
- Acute Laryngitis**, 87 ; **Pharyngitis**, 60 ; **Post-Nasal Catarrh**, 47 ; **Tonsillitis**, 81.
- Adductors, Paralysis of**, 108.
- Adenoid Vegetations of Naso-Pharynx**, 25.
- Affections of Tonsils**, 81 ;
 Uvula, 85.
- Anterior Nasal Douche**, 33 ;
 Rhinoscopy, 18.
- Arytænoides, Paralysis of**, 109.
- Autolaryngoscopy**, 14 ; **George Johnson on**, 15.
- Barth, on Tubercle of Pharynx**, 24.
- Cancer, of Larynx**, 103 ; **of Naso-Pharynx**, 58 ; **of Pharynx**, 77 ; **of Throat**, 26 ; **of Tonsil**, 85.
- Catarrh**, 21 ; **Dry**, 53 ; **of Larynx**, 87 ; **of Naso-Pharynx**, 47 ; **of Pharynx**, 60 ; **Post-Nasal**, 47.
- Chronic Enlargement of Tonsils**, 83 ; **Uvula**, 86 ; **Laryngitis**, 90 ; **Post-Nasal Catarrh**, 49.
- Coghill, his Respirator Inhaler**, 85, 96.
- Cotton-Wool Brush, Smyly's**, 88.
- Croup, Spasmodic**, 111 ; **True**, see **Laryngo-Tracheal Diphtheria**, 116.
- Degenerations of Throat**, 22.
- Diathetic Pharyngitis**, 65.
- Difficulties in Laryngoscopy**, 12.
- Digital Examination of Naso-Pharynx**, 19.
- Diphtheria**, 113 ; **Laryngo-Tracheal**, 116 ; **Treatment of**, 117.
- Diseases of Larynx**, 87 ; **Naso-Pharynx**, 46 ; **Pharynx**, 60.
- Douches**, 32 ; **Anterior-Nasal**, 33 ; **Posterior Nasal**, 34.
- Dry Catarrh, Post-Nasal**, 53 ;
 Pharyngeal, 63.
- Duplay, his Laryngeal Reflector**, 5 ; **his Speculum**, 16.
- Electricity, Application of**, 44 ;
 in Paralysis of Larynx, 109, 110, 111 ; **of Pharynx**, 81.
- Électrode, Laryngeal**, 44.
- Erysipelas in Throat**, 29.
- Examination, Laryngoscopic**, 8 ; **of Larynx**, 8 ; **Naso-Pharynx**, 16 ; **Pharynx**, 1 ; **Rhinoscopic**, 18.
- Exanthemata in Throat**, 29.

- Fibroma of Larynx**, 102; **Pharynx**, 77.
Foreign Bodies, in **Larynx**, 106; in **Naso-Pharynx**, 59; in **Pharynx**, 78; in **Tonsils**, 85.
 Fränkel, his **Speculum**, 16.

Galvano-Cautery, 40.
Gangrenous Pharyngitis, 68.
Gargles, 37.
General Pathology of Throat Diseases, 21.
Glottis, **Oedema of**, 88; **Spasm**, 111.
Gouty Sore-Throat, 68.
Granular Laryngitis, 92; **Pharyngitis**, 62.
Growths, in **Larynx**, **Removal of**, 104.

Herpes in Throat, 28.
Hyperæsthesia, of **Larynx**, 107; of **Pharynx**, 79.
Hypertrophy of Throat, 24.

Illumination of Throat, 1.
Image, **Laryngoscopic**, 7, 11; **Rhinoscopic**, 19.
Infiltrations of Throat, 24.
Inflammations of Throat, 22.
Inhalations, 84.
Insufflations, 86.
Internal Tensors, **Paralysis of**, 110.
Investigation of Throat Diseases, 1.

James, Prosser, his **Pastilles**, 37.
Johnson, George, on **Antolaryngoscopy**, 15; on **Removal of Polypi**, 48.

Lamps, **Varieties of**, 3.

Laryngeal-Brushes, 38; **Electrode**, 44; **Image**, 7, 8, 11; **Mirror**, 5; **Phthisis**, 92; **Polypi**, 26; **Reflector**, 5; **Syphilis**, 97.
Laryngismus Stridulus, 111.
Laryngitis, **Acute**, 87; **Chronic**, 90; **Oedematous**, 88; **Phthisical**, 92; **Syphilitic**, 97.
Laryngo-Phantom, 15.
Laryngoscope, 4; **Principle of**, 7.
Laryngoscopic Examination, 8.
Laryngoscopy, **Difficulties of**, 12.
Laryngo-Tracheal Diphtheria, 116.
Larynx, **Cancer of**, 103; **Diseases of**, 87; **Examination of**, 8; **Extirpation of**, 106; **Fibroma of**, 102; **Foreign Bodies in**, 106; **Growths in**, **Removal of**, 104; **Morbid Growths in**, 101; **Mucous Polypi of**, 102; **Neuroses of**, 107; **Papilloma of**, 101; **Perichondritis of**, 100; **Polypi of**, 26; **Syphilis of**, 97; **Tubercle in**, 92.
Lepra in Throat, 29.
Local Treatment of Throat Diseases, 32.
Löwenberg on Adenoid Growths, 26.
Lozenges, 37.
Lupus in Throat, 29.

Mackenzie, his **Tonsillotome**, 41.
Medicated Cotton-Wool, **Woakes's**, 52.
Meyer, on **Adenoid Growths**, 26.
Morbid Growths in Larynx, 101; in **Naso-Pharynx**, 58; in **Pharynx**, 77.

- Mucous Polypi of Larynx, 102.
- Nasal Douche, Anterior, 33; Posterior, 34.
- Naso-Pharynx, Abscess of, 54; Catarrh of, 47; Diseases of, 46; Digital, 19; Examination of, 16; Foreign Bodies in, 59; Morbid Growths in, 58; Polypi of, 25; Syphilis of, 56; Tubercle of, 55.
- Nervous Affections of Throat 30.
- Neuroses of Larynx, 107; of Pharynx, 79.
- Obstacles in Examination of Pharynx, 4.
- Oedema of Glottis, 88.
- Oedematous Laryngitis, 88.
- Operations on the Throat, 40.
- Papilloma, of Larynx, 101; of Pharynx, 77.
- Paralysis, of Abductors, 110; of Adductors, 108; of Arytænoideus, 109; Diphtheritic, 116; of Internal Tensor, 110.
- Pastilles, P. James's, 37.
- Perichondritis of Larynx, 100.
- Pharyngitis, 60; Acute, 60; Chronic, Granular or follicular, 62; Diathetic, 65; Gangrenous, 68; Sicca, 63; Ulcerative, 68.
- Pharynx, Diseases of, 60; Examination of, 1; Obstacles, 4; Foreign Bodies in, 78; Neuroses of, 79; Syphilis in, 74; Tubercle in, 71; Tumours of, 77.
- Phthisical Laryngitis, 92.
- Phthisis, of Larynx, 92; of Pharynx, 71.
- Pigments, 37.
- Polypi, of Larynx, 26, 101; of Naso-Pharynx, 25, 58; Removal of, 43.
- Polypus-Snare, Wilde's, 40.
- Posterior Nasal Douche, 34; Rhinoscopy, 18.
- Post-nasal Catarrh, 47; Acute, 47; Chronic, 49; Dry, 53.
- Quincy, 81.
- Respirator Inhaler, 35.
- Retropharyngeal Abscess, 70.
- Rheumatic Diathesis in Throat, 28; Sore-Throat, 66.
- Rhinoscopic Image, 19.
- Rhinoscopy, Anterior, 18; Posterior, 18.
- Roberts, William, his Respirator Inhaler, 35.
- Shurly on Dry Catarrh, 53.
- Smyly, Cotton-Wool Brush, 38.
- Sore-Throat, Gouty, 68; Rheumatic, 66.
- Spasm of Glottis, 111.
- Spasmodic Croup, 111.
- Speculum, Duplay's, 16; Fränkel's, 16; Zaufal's Naso-Pharyngeal, 16.
- Syphilis, of Larynx, 97; of Naso-Pharynx, 56; of Pharynx, 74; in Throat, 27.
- Syphilitic Laryngitis, 97; Pharyngitis, 74.
- Thomas, Llewelyn, on Varix, 61.
- Throat, Cancer of, 26; Degenerations of, 22; Erysipelas of, 29; Exanthemata in, 29; Herpes in, 28; Hypertrophy

- of, 24; Illumination of, 1; Infiltrations of, 24; Inflammations of, 23; Lepra in, 29; Lupus in, 29; Nervous Affections of, 30; Operations on, 40; Rheumatic Diathesis in, 28; Syphilis of, 27; Tubercle in, 27; Tumours of, 26.
- Throat Diseases, General Pathology of, 21; Investigation of, 1; Local Treatment of, 32.
- Tonsils, Affections of, 81; Cancer of, 85; Chronic Enlargement of, 83; Foreign Bodies in, 85.
- Tonsillitis, 81.
- Tonsillotomy, 40.
- Tracheotomy, 45; in Diphtheria, 119; for Foreign Bodies in Larynx, 107; in Laryngeal Phthisis, 97; for Laryngeal Polypus, 105; in Paralysis of Abductors, 111; in Perichondritis, 101; in Syphilis of Larynx, 99.
- Tubercle, in Larynx, 92; in Naso-Pharynx, 55; in Pharynx, 71; of Throat, 27.
- Tumours, of Larynx, 26, 101; of Naso-Pharynx, 25, 58; of Pharynx, 77; of Throat, 26.
- Ulcerative Pharyngitis, 68.
- Uvula, Affections of, 85.
- Varix, Llewelyn Thomas on, 61.
- Wet-compress, 28.
- Wilde's Polypus-Snare, 40.
- Woakes's Medicated Cotton-Wool, 52.
- Ziemssen, on Laryngeal Cancer, 102; on Etiology of Polypi, 104; on Paralysis of Abductors, 110.

INDEX OF NAMES OF AUTHORITIES

QUOTED OR REFERRED TO.

Barth, 24.	Meyer, 25, 50.
Billroth, 106.	Parker, 45, 119.
Browne, Lennox, 5, 28, 29, 32, 40, 74, 82.	Politzer, 47, 51.
Cadier, 96.	Reid, 112.
Coghill, 35.	Roberts, 35.
Czermak, 18.	Robinson, Beverley, 97.
Duplay, 5, 16.	Roosa, 51.
Foulis, 106.	Salathé, 112.
Fowler, 82.	Schmidt, 97.
Fränkel, 16, 27.	Schnitzler, 108.
Gibb, Duncan, 5, 8.	Schroetter, 101.
Grant, Dundas, 74.	Shurly, 53, 54.
Green, 22.	Smyly, 28.
Gruber, 57.	Steffen, 112.
Hardy, 80.	Thomas, Llewelyn, 61, 64.
Isambert, 72, 74, 75, 94.	Thomson, Roberts, 62.
James, Prosser, 5, 37.	Thornton, Pugin, 45.
Johnson, George, 5, 15, 43.	Troeltsch, 47.
Jones, Macnaughton, 26.	Trousseau, 67, 115, 118.
Lowenberg, 26, 50, 53.	Watson, Spencer, 58.
Mackenzie, Morell, 4, 26, 28, 64, 65, 67, 68, 75, 79, 86, 96, 98, 104, 105, 111, 113, 118.	Wendt, 47, 51, 57, 76.
Mandl, 8, 10, 22, 95.	Whistler, 98.
	Witkowski, 12.
	Woakes, 30, 52.
	Wreden, 54.
	Zaufal, 16.
	Ziemesen, 89, 102, 103, 110.



J. & A. CHURCHILL'S
MEDICAL CLASS BOOKS.

ANATOMY.

BRAUNE.—An Atlas of Topographical Anatomy, after Plane Sections of Frozen Bodies. By WILHELM BRAUNE, Professor of Anatomy in the University of Leipzig. Translated by EDWARD BELLAMY, F.R.C.S., and Member of the Board of Examiners; Surgeon to Charing Cross Hospital, and Lecturer on Anatomy in its School. With 84 Photo-lithographic Plates and 46 Woodcuts. Large imp. 8vo, 40s.

FLOWER.—Diagrams of the Nerves of the Human Body, exhibiting their Origin, Divisions, and Connexions, with their Distribution to the various Regions of the Cutaneous Surface, and to all the Muscles. By WILLIAM H. FLOWER, F.R.C.S., F.R.S., Hunterian Professor of Comparative Anatomy, and Conservator of the Museum, Royal College of Surgeons. Third Edition, containing 6 Plates. Royal 4to, 12s.

GODLEE.—An Atlas of Human Anatomy: illustrating most of the ordinary Dissections; and many not usually practised by the Student. By RICKMAN J. GODLEE, M.S., F.R.C.S., Assistant-Surgeon to University College Hospital, and Senior Demonstrator of Anatomy in University College. With 48 Imp. 4to Coloured Plates, containing 112 Figures, and a Volume of Explanatory Text, with many Engravings, 8vo, £4 14s. 6d.

HEATH.—Practical Anatomy: a Manual of Dissections. By CHRISTOPHER HEATH, F.R.C.S., Holme Professor of Clinical Surgery in University College and Surgeon to the Hospital. Fourth Edition. With 16 Coloured Plates and 264 Engravings. Crown 8vo, 14s.

NEW BURLINGTON STREET.

ANATOMY—continued.

HOLDEN.—**Human Osteology:** comprising a Description of the Bones, with Delineations of the Attachments of the Muscles, the General and Microscopical Structure of Bone and its Development. By **LUTHER HOLDEN, F.R.C.S.**, Consulting Surgeon to St. Bartholomew's Hospital, and **ALBAN DORAN, F.R.C.S.**, late Anatomical, now Pathological, Assistant to the Museum of the Royal College of Surgeons. Sixth Edition. With 61 Lithographic Plates and 89 Engravings. Royal 8vo. [In preparation.]

By the same Author.

A Manual of the Dissection of the Human Body. Fourth Edition. Revised by the Author and **JOHN LANGTON, F.R.C.S.**, Assistant Surgeon and Lecturer on Anatomy at St. Bartholomew's Hospital. With Engravings. 8vo, 16s.

ALSO,

Landmarks, Medical and Surgical. Third Edition. 8vo. [In preparation.]

LANCEREAUX.—**Atlas of Pathological Anatomy.** By **DR. LANCEREAUX.** Translated by **W. S. GREENFIELD, M.D.**, Physician to, and Lecturer on Pathological Anatomy at, St. Thomas's Hospital. With 70 Coloured Plates. Imperial 8vo. £5 5s.

MORRIS.—**The Anatomy of the Joints of Man.** By **HENRY MORRIS, M.A., F.R.C.S.**, Surgeon to, and Lecturer on Anatomy and Practical Surgery at, the Middlesex Hospital. With 44 Plates (19 Coloured) and Engravings. 8vo, 16s.

The Anatomical Remembrancer; or, Complete Pocket Anatomist. Eighth Edition. 32mo, 8s. 6d.

WAGSTAFFE.—**The Student's Guide to Human Osteology.** By **WM. WARWICK WAGSTAFFE, F.R.C.S.**, Assistant-Surgeon to, and Lecturer on Anatomy at, St. Thomas's Hospital. With 28 Plates and 66 Engravings. Fcap. 8vo, 10s. 6d.

NEW BURLINGTON STREET.

J. & A. Churchill's Medical Class Books.

ANATOMY—*continued.*

WILSON — BUCHANAN — CLARK. — **Wilson's**

Anatomist's Vade-Mecum: a System of Human Anatomy. Tenth Edition, by GEORGE BUCHANAN, Professor of Clinical Surgery in the University of Glasgow, and HENRY E. CLARK, M.R.C.S., Lecturer on Anatomy in the Glasgow Royal Infirmary School of Medicine. With 450 Engravings, including 26 Coloured Plates. Crown 8vo, 18s.

BOTANY.

BENTLEY.—**A Manual of Botany.** By Robert

BENTLEY, F.L.S., Professor of Botany in King's College and to the Pharmaceutical Society. With nearly 1200 Engravings. Fourth Edition. Crown 8vo. [In the press.]

BENTLEY AND TRIMEN.—**Medicinal Plants:**

being descriptions, with original Figures, of the Principal Plants employed in Medicine, and an account of their Properties and Uses. By ROBERT BENTLEY, F.L.S., and HENRY TRIMEN, M.B., F.L.S. In 4 Vols., large 8vo, with 306 Coloured Plates, bound in half morocco, gilt edges, £11 11s.

CHEMISTRY.

BERNAYS.—**Notes for Students in Chemistry;**

being a Syllabus of Chemistry compiled mainly from the Manuals of Fownes-Watts, Miller, Wurz, and Schorlemmer. By ALBERT J. BERNAYS, Ph.D., Professor of Chemistry at St. Thomas's Hospital. Sixth Edition. Fcap. 8vo, 8s. 6d.

By the same Author.

Skeleton Notes on Analytical Chemistry,

for Students in Medicine. Fcap. 8vo, 2s. 6d.

BOWMAN AND BLOXAM.—**Practical Chemistry,**

including Analysis. By JOHN E. BOWMAN, formerly Professor of Practical Chemistry in King's College, and CHARLES L. BLOXAM, Professor of Chemistry in King's College. With 93 Engravings. Seventh Edition. Fcap. 8vo, 6s. 6d.

NEW BURLINGTON STREET.

CHEMISTRY—*continued.*

BLOXAM.—Chemistry, Inorganic and Organic with Experiments. By CHARLES L. BLOXAM, Professor of Chemistry King's College. Fourth Edition. With nearly 300 Engravings. 8vo, 1

By the same Author.

Laboratory Teaching; or, Progressive Exercises in Practical Chemistry. Fourth Edition. With 83 Engravings. Crown 8vo, 5s. 6d.

CLOWES.—Practical Chemistry and Qualitative Inorganic Analysis. An Elementary Treatise, specially adapted for use in the Laboratories of Schools and Colleges, and by Beginners. By FRANK CLOWES, D.Sc., Senior Science Master at the High School, Newcastle-under-Lyme. Third Edition. With 47 Engravings. Post 8vo, 7s. 6d.

FOWNES AND WATTS.—Physical and Inorganic Chemistry. Twelfth Edition. By GEORGE FOWNES, F.R.S., and HENRY WATTS, B.A., F.R.S. With 154 Engravings, and Coloured Plate of Spectra. Crown 8vo, 8s. 6d.

By the same Authors.

Chemistry of Carbon - Compounds, or Organic Chemistry. Twelfth Edition. With Engravings. Crown 8vo, 10s.

LUFF.—An Introduction to the Study of Chemistry. Specially designed for Medical and Pharmaceutical Students. By A. P. LUFF, F.I.C., F.C.S., Lecturer on Chemistry in the Central School of Chemistry and Pharmacy. Crown 8vo, 2s. 6d.

TIDY.—A Handbook of Modern Chemistry, Inorganic and Organic. By C. MEYMOTT TIDY, M.B., Professor of Chemistry and Medical Jurisprudence at the London Hospital. 8vo, 16s.

VACHER.—A Primer of Chemistry, including Analysis. By ARTHUR VACHER. 18mo, 1s.

J. & A. Churchill's Medical Class Books.

CHEMISTRY—*continued.*

VALENTIN.—Introduction to Inorganic Chemistry. By WILLIAM G. VALENTIN, F.C.S. Third Edition. With 82 Engravings. 8vo, 6s. 6d.

By the same Author.

A Course of Qualitative Chemical Analysis.

Fifth Edition by W. R. HODGKINSON, Ph.D. (Würzburg), Demonstrator of Practical Chemistry in the Science Training Schools. With Engravings. 8vo, 7s. 6d.

ALSO,

Chemical Tables for the Lecture-room and

Laboratory. In Five large Sheets, 5s. 6d.

CHILDREN, DISEASES OF.

ELLIS.—A Practical Manual of the Diseases of Children. By EDWARD ELLIS, M.D., late Senior Physician to the Victoria Hospital for Sick Children. With a Formulary. Fourth Edition. Crown 8vo. [*In the press.*]

SMITH.—Clinical Studies of Disease in Children. By EUSTACE SMITH, M.D., F.R.C.P., Physician to H.M. the King of the Belgians, and to the East London Hospital for Children. Post 8vo, 7s. 6d.

By the same Author.

On the Wasting Diseases of Infants and

Children. Third Edition. Post 8vo, 8s. 6d.

STEINER.—Compendium of Children's Diseases; a Handbook for Practitioners and Students. By JOHANN STEINER, M.D. Translated by LAWSON TAIT, F.R.C.S., Surgeon to the Birmingham Hospital for Women, &c., 8vo, 12s. 6d.

DENTISTRY.

SEWILL.—The Student's Guide to Dental Anatomy and Surgery. By HENRY E. SEWILL, M.R.C.S., L.D.S., late Dental Surgeon to the West London Hospital. With 77 Engravings. Fcap. 8vo, 5s. 6d.

NEW BURLINGTON STREET.

J. & A. Churchill's Medical Class Books.

DENTISTRY—continued.

SMITH.—**Handbook of Dental Anatomy and Surgery.** For the Use of Students and Practitioners. By JOHN SMITH, M.D., F.R.S.E., Dental Surgeon to the Royal Infirmary, Edinburgh. Second Edition. Fcap. 8vo, 4s. 6d.

STOCKEN.—**Elements of Dental Materia Medica and Therapeutics, with Pharmacopœia.** By JAMES STOCKEN, L.D.S.R.C.S., late Lecturer on Dental Materia Medica and Therapeutics and Dental Surgeon to the National Dental Hospital. Second Edition. Fcap. 8vo, 6s. 6d.

TAFT.—**A Practical Treatise on Operative Dentistry.** By JONATHAN TAFT, D.D.S., Professor of Operative Surgery in the Ohio College of Dental Surgery. Third Edition. With 184 Engravings. 8vo, 12s.

TOMES (C. S.).—**Manual of Dental Anatomy, Human and Comparative.** By CHARLES S. TOMES, M.A., M.R.C.S., Lecturer on Anatomy and Physiology at the Dental Hospital of London. Second Edition. With Engravings. Crown 8vo. [*In preparation.*]

TOMES (J. and C. S.).—**A Manual of Dental Surgery.** By JOHN TOMES, M.R.C.S., F.R.S., and CHARLES S. TOMES, M.A., M.R.C.S. Second Edition. With 262 Engravings. Fcap. 8vo, 14s.

EAR, DISEASES OF.

BURNETT.—**The Ear: its Anatomy, Physiology, and Diseases.** A Practical Treatise for the Use of Medical Students and Practitioners. By CHARLES H. BURNETT, M.D., Aural Surgeon to the Presbyterian Hospital, Philadelphia. With 87 Engravings. 8vo, 18s.

DALBY.—**On Diseases and Injuries of the Ear.** By WILLIAM B. DALBY, F.R.C.S., Aural Surgeon to, and Lecturer on Aural Surgery at, St. George's Hospital. Second Edition. With Engravings. Fcap. 8vo, 6s. 6d.

NEW BURLINGTON STREET.

J. & A. Churchill's Medical Class Books.

EAR, DISEASES OF—*continued.*

JONES.—A Practical Treatise on Aural Surgery. By H. MACNAUGHTON JONES, M.D., Professor of the Queen's University in Ireland, Surgeon to the Cork Ophthalmic and Aural Hospital. With 46 Engravings. Crown 8vo, 5s.

By the same Author.

Atlas of the Diseases of the Membrana Tympani. In Coloured Plates, containing 59 Figures. With Explanatory Text. Crown 4to, 21s.

FORENSIC MEDICINE.

OGSTON.—Lectures on Medical Jurisprudence.

By FRANCIS OGSTON, M.D., Professor of Medical Jurisprudence and Medical Logic in the University of Aberdeen. Edited by FRANCIS OGSTON, Jun., M.D., Assistant to the Professor of Medical Jurisprudence and Lecturer on Practical Toxicology in the University of Aberdeen. With 12 Plates. 8vo, 18s.

TAYLOR.—The Principles and Practice of

Medical Jurisprudence. By ALFRED S. TAYLOR, M.D., F.R.S., late Professor of Medical Jurisprudence to Guy's Hospital. Second Edition. With 189 Engravings. 2 Vols. 8vo, 31s. 6d.

By the same Author.

A Manual of Medical Jurisprudence.

Tenth Edition. With 56 Engravings. Crown 8vo, 14s.

ALSO,

On Poisons, in relation to Medical Jurisprudence and Medicine. Third Edition. With 104 Engravings. Crown 8vo, 16s.

WOODMAN AND TIDY.—A Handy-Book of

Forensic Medicine and Toxicology. By W. BATHURST WOODMAN, M.D., F.R.C.P.; and C. MEYMOTT TIDY, M.B. With 8 Lithographic Plates and 116 Wood Engravings. 8vo, 31s. 6d.

HYGIENE.

WILSON.—A Handbook of Hygiene and Sani-

tary Science. By GEORGE WILSON, M.A., M.D., Medical Officer of Health for Mid Warwickshire. Fourth Edition. With Engravings. Crown 8vo, 10s. 6d.

NEW BURLINGTON STREET.

HYGIENE—continued.

• **PARKES—A Manual of Practical Hygiene**

By **LIEUT. A. PARKES, M.D., F.R.S.** Fifth Edition by **P. DE CRAW**
M.D., F.R.S. Professor of Military Hygiene in the Army Medical School. With 9 Plates and 112 Engravings. 8vo, 19s.

By the same Author.

Public Health: being a Concise Sketch of

the Sanitary Considerations connected with the Land, with Cities,
Villages, Houses, and Individuals. Revised by Professor **WILLIAM**
ARTER, M.D., F.R.S. Crown 8vo, 2s. 6d.

MATERIA MEDICA AND THERAPEUTICS.

BINZ AND SPARKS.—The Elements of Therapeutics:

a Clinical Guide to the Action of Medicines. By **C. BINZ, M.D.**, Professor of Pharmacology in the University of Bonn. Translated and Edited with Additions, in conformity with the British and American Pharmacopœias, by **EDWARD I. SPARKS, M.A., M.B., F.R.C.P. Lond.** Crown 8vo, 9s. 6d.

OWEN.—Tables of Materia Medica; comprising

the Contents, Doses, Proportional Composition, and Methods of Manufacture of Pharmacopœial Preparations. By **ISAMBARD OWEN, M.B., M.R.C.P.**, Lecturer on Materia Medica at St. George's Hospital. Fifth Edition. Crown 8vo, 2s. 6d.

ROYLE AND HARLEY.—A Manual of Materia

Medica and Therapeutics. By **J. FORBES ROYLE, M.D., F.R.S.**, and **JOHN HARLEY, M.D., F.R.C.P.**, Physician to, and Joint Lecturer on Clinical Medicine at, St. Thomas's Hospital. Sixth Edition. With 139 Engravings. Crown 8vo, 15s.

THOROWGOOD.—The Student's Guide to

Materia Medica. By **JOHN C. THOROWGOOD, M.D., F.R.C.P.**, Lecturer on Materia Medica at the Middlesex Hospital. With Engravings. Fcap. 8vo, 6s. 6d.

WARING.—A Manual of Practical Therapeutics.

By **EDWARD J. WARING, M.D., F.R.C.P.** Third Edition. Fcap. 8vo, 12s. 6d.

NEW BURLINGTON STREET.

MEDICINE.

BARCLAY.—A Manual of Medical Diagnosis.

By A. WHYTE BARCLAY, M.D., F.R.C.P., Physician to, and Lecturer on Medicine at, St. George's Hospital. Third Edition. Fcap. 8vo, 10s. 6d.

CHARTERIS.—The Student's Guide to the

Practice of Medicine. By MATTHEW CHARTERIS, M.D., Professor of Materia Medica, University of Glasgow; Physician to the Royal Infirmary. With Engravings on Copper and Wood. Second Edition. Fcap. 8vo, 6s. 6d.

FENWICK.—The Student's Guide to Medical

Diagnosis. By SAMUEL FENWICK, M.D., F.R.C.P., Physician to the London Hospital. Fifth Edition. With 110 Engravings. Fcap. 8vo, 7s.

By the same Author.

The Student's Outlines of Medical Treatment. Fcap. 8vo, 7s.

FLINT.—Clinical Medicine : a Systematic Treatise on the

Diagnosis and Treatment of Disease. By AUSTIN FLINT, M.D., Professor of the Principles and Practice of Medicine, &c., in Bellevue Hospital Medical College. 8vo, 20s.

By the same Author.

A Manual of Percussion and Auscultation ;
of the Physical Diagnosis of Diseases of the Lungs and Heart, and
of Thoracic Aneurism. Post 8vo, 6s. 6d.

HALL.—Synopsis of the Diseases of the Larynx,

Lungs, and Heart : comprising Dr. Edwards' Tables on the Examination of the Chest. With Alterations and Additions. By F. DE HAVILLAND HALL, M.D., Assistant-Physician to the Westminster Hospital. Royal 8vo, 2s. 6d.

SANSOM.—Manual of the Physical Diagnosis

of Diseases of the Heart, including the use of the Sphygmograph and Cardiograph. By A. E. SANSOM, M.D., F.R.C.P., Assistant-Physician to the London Hospital. Third Edition, with 47 Woodcuts. Fcap. 8vo, 7s. 6d.

J. & A. Churchill's Medical Class Books.

MEDICINE—continued.

WARNER.—**Student's Guide to Medical Case-Taking.** By FRANCIS WARNER, M.D., Assistant-Physician to the London Hospital. Fcap. 8vo. 5s.

WHITTAKER.—**Students' Primer on the Urine.** By J. TRAVIS WHITTAKER, M.D., Clinical Demonstrator at the Royal Infirmary, Glasgow. With Illustrations, and 16 Plates etched on Copper. Post 8vo, 4s. 6d.


MIDWIFERY.

BARNES.—**Lectures on Obstetric Operations,** including the Treatment of Hæmorrhage, and forming a Guide to the Management of Difficult Labour. By ROBERT BARNES, M.D., F.R.C.P., Obstetric Physician to, and Lecturer on Diseases of Women, &c., at St. George's Hospital. Third Edition. With 124 Engravings. 8vo, 18s.

CLAY.—**The Complete Handbook of Obstetric Surgery;** or, Short Rules of Practice in every Emergency, from the Simplest to the most formidable Operations connected with the Science of Obstetrics. By CHARLES CLAY, M.D., late Senior Surgeon to, and Lecturer on Midwifery at, St. Mary's Hospital, Manchester. Third Edition. With 91 Engravings. Fcap. 8vo, 6s. 6d.

RAMSBOTHAM.—**The Principles and Practice** of Obstetric Medicine and Surgery. By FRANCIS H. RAMSBOTHAM, M.D., formerly Obstetric Physician to the London Hospital. Fifth Edition. With 120 Plates, forming one thick handsome volume. 8vo, 22s.

ROBERTS.—**The Student's Guide to the Practice** of Midwifery. By D. LLOYD ROBERTS, M.D., F.R.C.P., Physician to St. Mary's Hospital, Manchester. Second Edition. With 111 Engravings. Fcap. 8vo, 7s.

 **NEW BURLINGTON STREET.**

MIDWIFERY—*continued.*

CHROEDER.—**A Manual of Midwifery ; including the Pathology of Pregnancy and the Puerperal State.** By KARL SCHROEDER, M.D., Professor of Midwifery in the University of Erlangen. Translated by CHARLES H. CARTER, M.D. With Engravings. 8vo, 12s. 6d.

WAYNE.—**Obstetric Aphorisms for the Use of Students commencing Midwifery Practice.** By JOSEPH G. SWAYNE, M.D., Lecturer on Midwifery at the Bristol School of Medicine. Seventh Edition. With Engravings. Fcap. 8vo, 3s. 6d.

MICROSCOPY.

ARPENTER.—**The Microscope and its Revelations.** By WILLIAM B. CARPENTER, C.B., M.D., F.R.S. Sixth Edition. With more than 500 Engravings. Crown 8vo. [*Nearly ready.*]

MARSH.—**Section-Cutting : a Practical Guide to the Preparation and Mounting of Sections for the Microscope, special prominence being given to the subject of Animal Sections.** By Dr. SYLVESTER MARSH. With Engravings. Fcap. 8vo, 2s. 6d.

MARTIN.—**A Manual of Microscopic Mounting.** By JOHN H. MARTIN, Member of the Society of Public Analysts, &c. Second Edition. With several Plates and 144 Engravings. 8vo, 7s. 6d.

OPHTHALMOLOGY.

DAGUENET.—**A Manual of Ophthalmoscopy for the Use of Students.** By Dr. DAGUENET. Translated by C. S. JEAFFRESON, Surgeon to the Newcastle-on-Tyne Eye Infirmary. With Engravings. Fcap. 8vo, 5s.

HIGGINS.—**Hints on Ophthalmic Out-Patient Practice.** By CHARLES HIGGINS, F.R.C.S., Ophthalmic Assistant-Surgeon to, and Lecturer on Ophthalmology at, Guy's Hospital. Second Edition. Fcap. 8vo, 3s.

J. & A. Churchill's Medical Class Books.

OPHTHALMOLOGY—continued.

JONES.—A Manual of the Principles and Practice of Ophthalmic Medicine and Surgery. By T. WHARTON JONES, F.R.C.S., F.R.S., Ophthalmic Surgeon and Professor of Ophthalmology to University College Hospital. Third Edition. With 9 Coloured Plates and 173 Engravings. Fcap. 8vo, 12s. 6d.

MACNAMARA.—A Manual of the Diseases of the Eye. By CHARLES MACNAMARA, F.R.C.S., Surgeon to Westminster Hospital. Third Edition. With 7 Coloured Plates and 52 Engravings. Fcap. 8vo, 12s. 6d.

NETTLESHIP.—The Student's Guide to Diseases of the Eye. By EDWARD NETTLESHIP, F.R.C.S., Ophthalmic Surgeon to, and Lecturer on Ophthalmic Surgery at, St. Thomas's Hospital. With 48 Engravings. Fcap. 8vo, 7s. 6d.

PATHOLOGY.

JONES AND SIEVEKING.—A Manual of Pathological Anatomy. By C. HANDFIELD JONES, M.B., F.R.S., and EDWARD H. SIEVEKING, M.D., F.R.C.P. Second Edition. Edited, with considerable enlargement, by J. F. PAYNE, M.B., Assistant-Physician and Lecturer on General Pathology at St. Thomas's Hospital. With 196 Engravings. Crown 8vo, 16s.

VIRCHOW. — Post-Mortem Examinations: a Description and Explanation of the Method of Performing them, with especial reference to Medico-Legal Practice. By Professor RUDOLPH VIRCHOW, Berlin Charité Hospital. Translated by Dr. T. B. SMITH. Second Edition, with 4 Plates. Fcap. 8vo, 3s. 6d.

WILKS AND MOXON.—Lectures on Pathological Anatomy. By SAMUEL WILKS, M.D., F.R.S., Physician to, and Lecturer on Medicine at, Guy's Hospital; and WALTER MOXON, M.D., F.R.C.P., Physician to, and Lecturer on Clinical Medicine at, Guy's Hospital. Second Edition. With 7 Steel Plates. 8vo, 18s.

PSYCHOLOGY.

BUCKNILL AND TUKE.—A Manual of Psychological Medicine: containing the Lunacy Laws, Nosology, *Ætiology*, Statistics, Description, Diagnosis, Pathology, and Treatment of Insanity, with an Appendix of Cases. By JOHN C. BUCKNILL, M.D., F.R.S., and D. HACK TUKE, M.D., F.R.C.P. Fourth Edition, with 12 Plates (30 Figures). 8vo, 25s.

NEW BURLINGTON STREET.

PHYSIOLOGY.

CARPENTER.—**Principles of Human Physiology.** By WILLIAM B. CARPENTER, C.B., M.D., F.R.S. Ninth Edition. Edited by Henry Power, M.B., F.R.C.S. With 3 Steel Plates and 377 Wood Engravings. 8vo, 31s. 6d.

By the same Author.

A Manual of Physiology. With upwards of 250 Illustrations. Fifth Edition. Crown 8vo. [*In preparation.*]

DALTON.—**A Treatise on Human Physiology :** designed for the use of Students and Practitioners of Medicine. By JOHN C. DALTON, M.D., Professor of Physiology and Hygiene in the College of Physicians and Surgeons, New York. Sixth Edition. With 316 Engravings. Royal 8vo, 20s.

FREY.—**The Histology and Histo-Chemistry of Man.** A Treatise on the Elements of Composition and Structure of the Human Body. By HEINRICH FREY, Professor of Medicine in Zurich. Translated by ARTHUR E. BARKER, Assistant-Surgeon to the University College Hospital. With 608 Engravings. 8vo, 21s.

FULTON.—**A Text-Book of Physiology, including Histology.** By J. FULTON, M.D., Professor of Physiology and Sanitary Science in Trinity Medical College, Toronto; Surgeon to the Toronto General Hospital. Second Edition, with 151 Engravings. 8vo, 15s.

RUTHERFORD.—**Outlines of Practical Histology.** By WILLIAM RUTHERFORD, M.D., F.R.S., Professor of the Institutes of Medicine in the University of Edinburgh; Examiner in Physiology in the University of London. Second Edition. With 63 Engravings. Crown 8vo (with additional leaves for Notes), 6s.

SANDERSON.—**Handbook for the Physiological Laboratory :** containing an Exposition of the fundamental facts of the Science, with explicit Directions for their demonstration. By J. BURDON SANDERSON, M.D., F.R.S., Jodrell Professor of Physiology in University College; E. KLEIN, M.D., F.R.S., Assistant-Professor in the Brown Institution; MICHAEL FOSTER, M.D., F.R.S., Prælector of Physiology at Trinity College, Cambridge; and T. LAUDER BRUNTON, M.D., F.R.S., Lecturer on Materia Medica at St. Bartholomew's Hospital Medical College. 2 Vols., with 123 Plates. 8vo, 24s.

SURGERY.

BRYANT. — A Manual for the Practice

Surgery. By THOMAS BRYANT, F.R.C.S., Surgeon to, and Lecturer Surgery at, Guy's Hospital. Third Edition. With 672 Engravings (nearly all original, many being coloured). 2 vols. Crown 8vo, 28s.

BELLAMY. — The Student's Guide to Surgical

Anatomy; a Description of the more important Surgical Regions of the Human Body, and an Introduction to Operative Surgery. By EDWARD BELLAMY, F.R.C.S., and Member of the Board of Examiners; Surgeon to, and Lecturer on Anatomy at, Charing Cross Hospital. Second Edition. With 76 Engravings. Fcap. 8vo, 7s.

CLARK AND WAGSTAFFE. — Outlines of

Surgery and Surgical Pathology. By F. LE GROS CLARK, F.R.C.S., F.R.S., Consulting Surgeon to St. Thomas's Hospital. Second Edition. Revised and expanded by the Author, assisted by W. W. WAGSTAFFE, F.R.C.S., Assistant-Surgeon to St. Thomas's Hospital. 8vo, 10s. 6d.

DRUITT. — The Surgeon's Vade-Mecum; a

Manual of Modern Surgery. By ROBERT DRUITT, F.R.C.S. Eleventh Edition. With 369 Engravings. Fcap. 8vo, 14s.

FERGUSON. — A System of Practical Surgery.

By Sir WILLIAM FERGUSON, Bart., F.R.C.S., F.R.S., late Surgeon and Professor of Clinical Surgery to King's College Hospital. With 463 Engravings. Fifth Edition. 8vo, 21s.

HEATH. — A Manual of Minor Surgery and

Bandaging, for the use of House-Surgeons, Dressers, and Junior Practitioners. By CHRISTOPHER HEATH, F.R.C.S., Holme Professor of Clinical Surgery in University College and Surgeon to the Hospital. Sixth Edition. With 115 Engravings. Fcap. 8vo. 5s. 6d.

By the same Author.

A Course of Operative Surgery: with

Twenty Plates drawn from Nature by M. LÉVILLÉ, and Coloured by hand under his direction. Large 8vo, 40s.

ALSO,

The Student's Guide to Surgical Diag-

nosis. Fcap. 8vo, 6s. 6d.

NEW BURLINGTON STREET.

SURGERY—continued.

MAUNDER.—Operative Surgery. By Charles

F. MAUNDER, F.R.C.S., late Surgeon to, and Lecturer on Surgery at, the London Hospital. Second Edition. With 164 Engravings. Post 8vo, 6s.

PIRRIE.—The Principles and Practice of

Surgery. By WILLIAM PIRRIE, F.R.S.E., Professor of Surgery in the University of Aberdeen. Third Edition. With 490 Engravings. 8vo, 28s.

TERMINOLOGY.

DUNGLISON.—Medical Lexicon: a Dictionary

of Medical Science, containing a concise Explanation of its various Subjects and Terms, with Accentuation, Etymology, Synonymes, &c. By ROBLEY DUNGLISON, M.D. New Edition, thoroughly revised by RICHARD J. DUNGLISON, M.D. Royal 8vo, 28s.

MAYNE.—A Medical Vocabulary: being an

Explanation of all Terms and Phrases used in the various Departments of Medical Science and Practice, giving their Derivation, Meaning, Application, and Pronunciation. By ROBERT G. MAYNE, M.D., LL.D., and JOHN MAYNE, M.D., L.R.C.S.E. Fifth Edition. Fcap. 8vo.

[In the press.]

WOMEN, DISEASES OF.

BARNES.—A Clinical History of the Medical

and Surgical Diseases of Women. By ROBERT BARNES, M.D., F.R.C.P., Obstetric Physician to, and Lecturer on Diseases of Women, &c., at, St. George's Hospital. Second Edition. With 191 Engravings. 8vo, 28s.

DUNCAN.—Clinical Lectures on the Diseases

of Women. By J. MATTHEWS DUNCAN, M.D., Obstetric Physician to St. Bartholomew's Hospital. 8vo, 8s.

EMMET.—The Principles and Practice of

Gynaecology. By THOMAS ADDIS EMMET, M.D., Surgeon to the Woman's Hospital of the State of New York. With 130 Engravings. Royal 8vo, 24s.

J. & A. Churchill's Medical Class Books.

WOMEN, DISEASES OF—continued.

GALABIN.—The Student's Guide to the Diseases of Women. By ALFRED L. GALABIN, M.D., F.R.C.P., Assist. Obstetric Physician and Joint Lecturer on Obstetric Medicine at Guy's Hospital. Second Edition. With 70 Engravings. Fcap. 8vo, 7s. 6d.

REYNOLDS.—Notes on Diseases of Women. Specially designed for Students preparing for Examination. By J. J. REYNOLDS, M.B.C.S. Fcap. 8vo, 2s. 6d.

SMITH.—Practical Gynæcology: a Handbook of the Diseases of Women. By HERWOOD SMITH, M.D., Physician to the Hospital for Women and to the British Lying-in Hospital. With Engravings. Crown 8vo, 5s. 6d.

WEST AND DUNCAN.—Lectures on the Diseases of Women. By CHARLES WEST, M.D., F.R.C.P. Fourth Edition. Revised and in part re-written by the Author, with numerous additions, by J. MATTHEWS DUNCAN, M.D., Obstetric Physician to St. Bartholomew's Hospital. 8vo, 16s.

ZOOLOGY.

BRADLEY.—Manual of Comparative Anatomy and Physiology. By S. MESSENGER BRADLEY, F.R.C.S., late Lecturer on Practical Surgery in Owen's College, Manchester. Third Edition. With 61 Engravings. Post 8vo, 6s. 6d.

CHAUVEAU AND FLEMING.—The Comparative Anatomy of the Domesticated Animals. By A. CHAUVEAU, Professor at the Lyons Veterinary School; and GEORGE FLEMING, Veterinary Surgeon, Royal Engineers. With 450 Engravings. 8vo, 31s. 6d.

HUXLEY.—Manual of the Anatomy of Invertebrated Animals. By THOMAS H. HUXLEY, LL.D., F.R.S. With 156 Engravings. Fcap. 8vo, 16s.

By the same Author.

Manual of the Anatomy of Vertebrated Animals. With 110 Engravings. Post 8vo, 12s.

WILSON.—The Student's Guide to Zoology: a Manual of the Principles of Zoological Science. By ANDREW WILSON, Lecturer on Natural History, Edinburgh. With Engravings. Fcap. 8vo, 6s. 6d.

NEW BURLINGTON STREET.



!



